AMERICAN ARTISAN

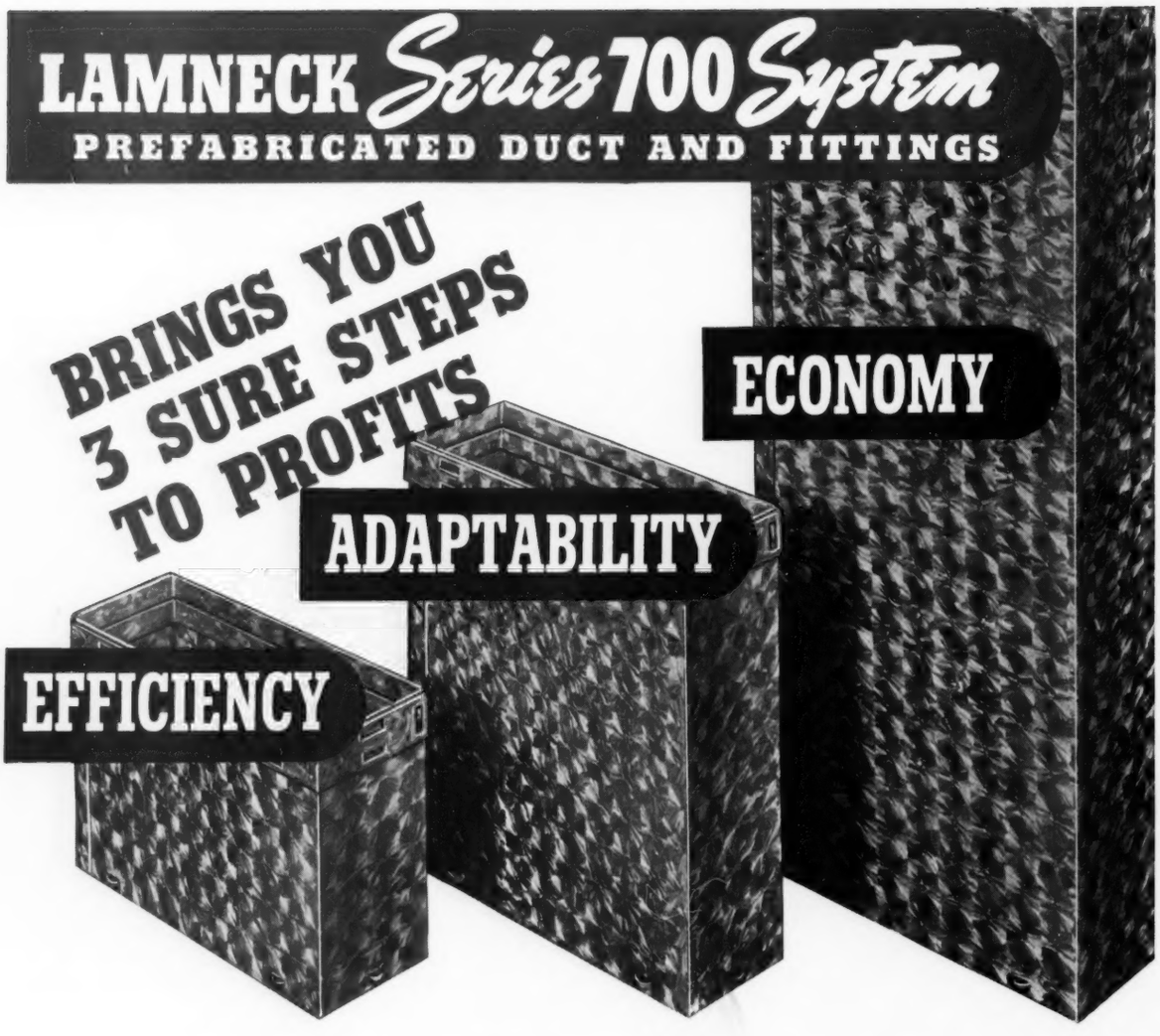
DECEMBER 1940

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1880

LAMNECK *Series 700 System*

PREFABRICATED DUCT AND FITTINGS



• Predetermined Engineering makes possible the unequalled efficiency of LAMNECK "Series 700 System" prefabricated Duct and Fittings. It assures maximum air delivery with the absolute minimum sizes of Duct and Fittings. Not only does Lamneck "Series 700 System" assure an efficiently operating installation, but one of quality appearance of which you can be proud.

• The adaptability of the LAMNECK "Series 700 System" makes possible a correctly planned and efficiently operating completed installation. It provides for economies which permit installation in modern "low-cost" housing where maximum investment is restricted, yet Lamneck "Series 700 System" meets every requirement on jobs where quality is of first consideration.

• With LAMNECK Prefabricated Duct and Fittings you save on estimating time, shop time, installation time, and you actually buy fewer *pounds* of metal . . . there is no waste or scrap. Yes, LAMNECK "Series 700 System" means real economy. Its quality is recognized by architects and builders who demand efficiency, adaptability, economy, and long service free of maintenance.

Write for the name of your nearest Lamneck Distributor

Specify **LAMNECK** LP INC.

Prefabricated Duct and Fittings for all Types of Residential Warm Air Heating and Air Conditioning Systems.

LAMNECK PRODUCTS, INC.

Middletown, Ohio

VIKING DID IT THE HARD WAY

The Viking organization was a depression baby. We started with limited resources, without background, and without influence. Everything we got, we got the hard way. It was a case of "root hog or die."

Viking has never been a price cutter. We make a fair profit on everything we manufacture and intend to keep on doing so. We did not resort to price cutting as our entering wedge. Our merchandise sold because it was better.

There is no particular secret about our success. We simply worked harder and put more study on our customers' problems. We simply plowed back our profits into better experimental and testing apparatus. The results have been profitable to Viking and Viking customers.

Nobody knows nearly enough about handling air, but we submit that we know at least as much about it as anybody else in the business. We can make a smaller wheel do more work and make less noise—as dozens of our customers will testify.

No company has a right to invade a new industry unless it is in a position to contribute definitely to its arts and practices. On this basis we feel that Viking has earned its place as a leader in the field of air conditioning.

We are at *your* service.

FANS . . . . . .
BLOWERS . . .
HUMIDIFIERS

Viking Air Conditioning Corp.
9412 Richmond Avenue, S. E.
Cleveland, Ohio

VIKING AIR CONDITIONING CORPORATION

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES and SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 109, No. 12 — December, 1940 — Founded 1880

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In This Issue

DUCT construction should be neat, efficient, and substantial. The cover photograph shows an Illinois installation which the house architect thought especially satisfactory.

•

New businesses seem to be particularly receptive to other new businesses. The air travel business is comparatively new (see page 33) and air service has been a leader in adopting air conditioning to increase passenger comfort. This article describes a 1940 administration building and contains a particularly interesting idea in the plane cooling and heating service from the central air conditioning equipment.

•

We continue Henry Aronson's discussion of a precalculated Technical Code on page 38. The author takes a typical plan and begins design of a system from his precalculated tables and charts. We call especial attention to the Crackage and Area charts which should be savers of much time in figuring heat losses.

•

We have published a number of articles by Carter Cole and Lawrence Gichner showing vividly what happens when sheet metal is improperly applied as a weather protection. We take pleasure in publishing on page 51 a description of a re-roofing project where copper installed by the same roofer 50 years ago is today in perfect condition and needed no repair.

•

Handcraft in the sheet metal industry has pretty much gone the way of all other hand crafts, but here and there is a shop which still makes items by hand. Mostly, though, these handcrafted articles are made for the gift and souvenir trade. In New Orleans (see page 60) Zansler Bros. still make commercial items by hand in tens of thousands of items. It is a most unusual business.

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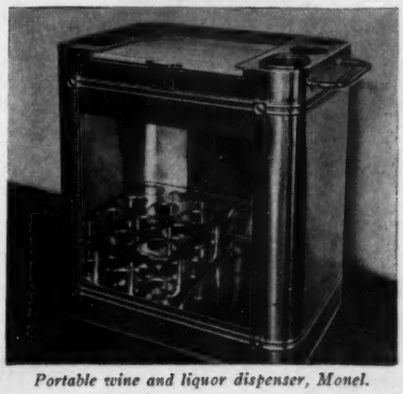
More than 8,000 copies of this issue are being distributed

"Or Nuts!"

BY TIM SHEARS

Lobster pound lined with Monel.

Hospital dish cabinet of #35 Monel.



Portable wine and liquor dispenser, Monel.

An Englishman back from a trip to the States is playin' cards an' his club mates want to know what new games did he see across the pond.

"Y'know, I saw a most extr'ordn'ry game," says he. "Most peculiar name, too . . . 'Or Nuts', I b'lieve they call it. A frightf'ly large crowd was playing, and everyone had a little green card. A man at the front of the room was calling out 'Under the I, twenty-one, under the G, fifteen, under the N, thirty-three.' I was trying to decipher this code, when all at once a man at the back of the room jumped up and shouted 'Bingo!' And then, by Jove," his lordship goes on, "a most extr'ordn'ry thing happened! Everyone else in the whole bally place threw down his card and said 'Or Nuts!' "

Well, Nuts or Wine or what-have-you, anything to eat an' drink means sheet metal jobs that you can make dough on. But don't get the idea that tables, sinks, ranges an' other everyday items are the whole works. In practically every hospital, hotel or restaurant you walk into there's more than meets the eye.

To prove it I've collected some pictures of jobs that aren't run of the mill kind of stuff. Take a look at them, an' you'll see that every one is a cinch to make . . . an' profitable when you make 'em out of Monel.

One thing you want to remember: For jobs like these, #35 Monel is a real land-the-order sheet. Just as tough, strong, rust proof an' easy to work as the others . . . but a sheet with a *swell factory finish at a price anybody can afford.*

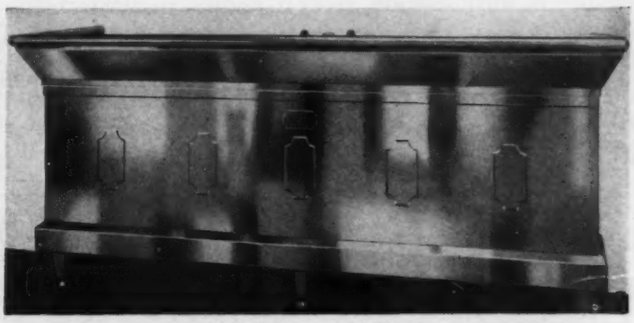
So keep your eyes peeled for little jobs with big profit margins. You'll find 'em any place where they serve meals, liquors, wine . . . or nuts.

TIM SHEARS

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York, N. Y.

Electrically heated service table of #35 Monel.



Cocktail bar made of Monel.

Announcing

THE BLUE RIBBON WINNER *for 1941*

ATTRACTIVE APPEARANCE

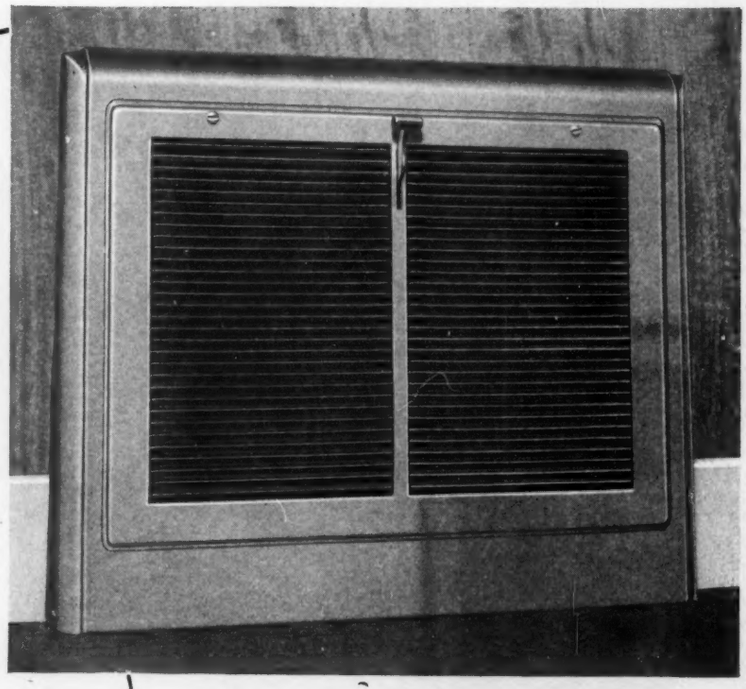
LARGE FREE AREA

NEW METALUSTRE FINISH

LOW RESISTANCE

ADJUSTABLE FINS

EXCELLENT AS REPLACEMENT REGISTER



The NEW H&C No. 130 SERIES

Ready for Shipment in March 1941

- *Attractive Appearance*—modern as today, yet sufficiently conservative and inconspicuous to appeal to everyone.
- *New Metalustre Finish*—a rich brown lacquer finish in excellent good taste, attractively priced in Group I (the same price as Black Japan finish).
- *Large Free Area*—approximately 80%, which means that size 12 x 8 can be used on a 10″ pipe.
- *Low Resistance*—Exhaustive tests conclusively prove the resistance of No. 130 to be considerably less than that of the conventional registers of this type, due to the fact that the fins are perpendicular to the face. Low resistance means high efficiency.
- *Adjustability*—Fins may be adjusted up or down as desired with key furnished.
- *Excellent as Replacement Register*—Whenever an existing gravity installation is to be changed to air conditioning. New valve mechanism holds securely in any position even when used with air conditioning. Never requires adjustment.
- *IMPORTANT*—The overall dimensions of No. 130 Series Registers are identical with those of all other Hart & Cooley Gravity Baseboard Registers, making replacement a simple matter.

SIDEWALL REGISTERS AND RETURN AIR INTAKES TO MATCH

TURNING THE FINS

YOUR JOBBER WILL HAVE SAMPLES EARLY IN JANUARY. BE SURE TO SEE THIS NEW LINE BEFORE PLACING YOUR STOCK ORDER.

HART & COOLEY MANUFACTURING CO.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulleys

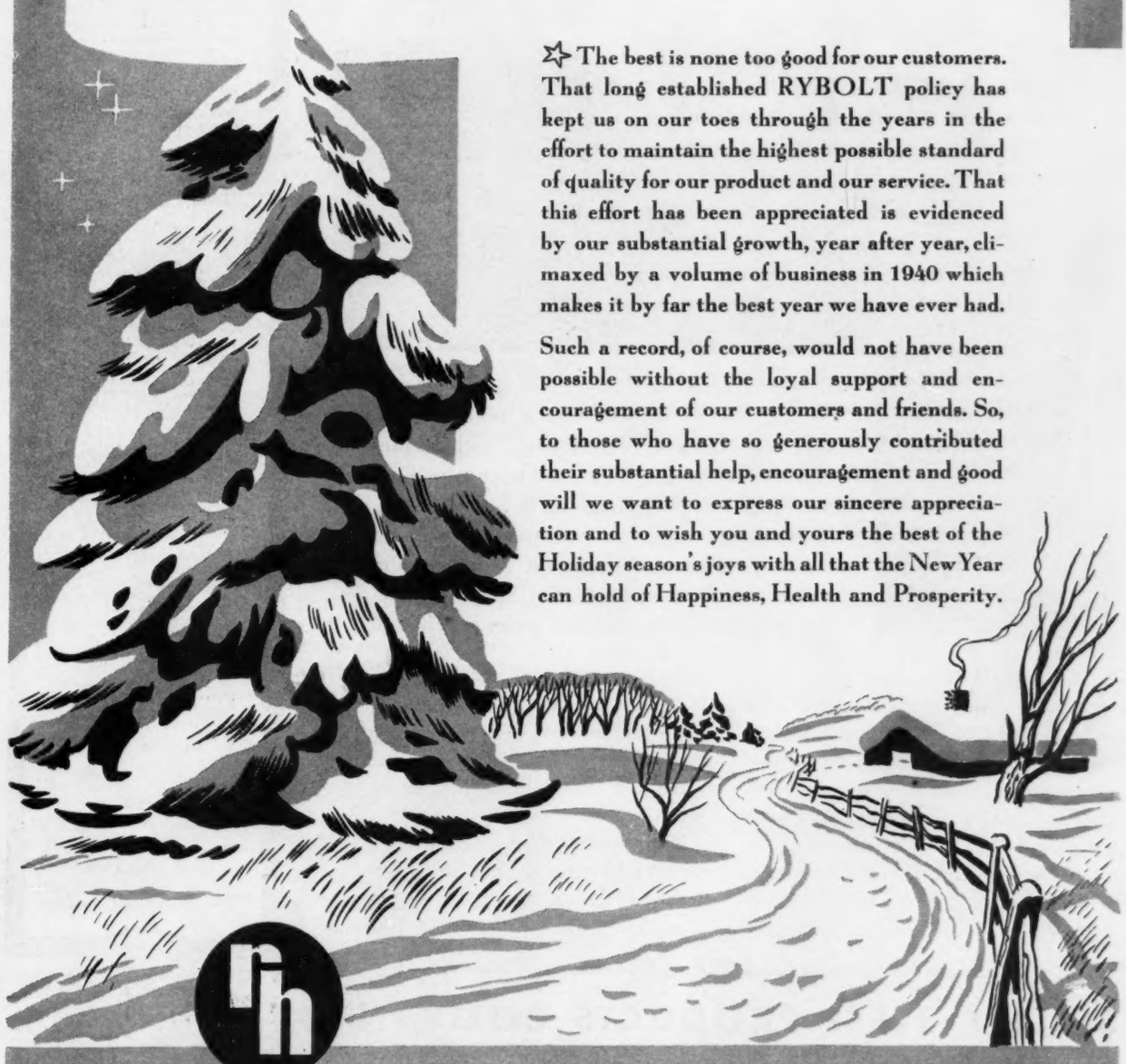
FACTORY AND ENGINEERING SALES OFFICE:

HOLLAND (H&C) MICHIGAN

Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.

Wishing You

THE SEASON'S BEST



☆ The best is none too good for our customers. That long established RYBOLT policy has kept us on our toes through the years in the effort to maintain the highest possible standard of quality for our product and our service. That this effort has been appreciated is evidenced by our substantial growth, year after year, climaxed by a volume of business in 1940 which makes it by far the best year we have ever had.

Such a record, of course, would not have been possible without the loyal support and encouragement of our customers and friends. So, to those who have so generously contributed their substantial help, encouragement and good will we want to express our sincere appreciation and to wish you and yours the best of the Holiday season's joys with all that the New Year can hold of Happiness, Health and Prosperity.

THE RYBOLT HEATER COMPANY

615 MILLER STREET • ASHLAND, OHIO

Call Scully

AND RELAX!

"An order was received at noon Saturday," says our Newark Warehouse, "with request to deliver in Corning, N.Y., not later than Tuesday morning. It was for large C. B. Sections and was immediately shipped by railroad. It was at customer's siding in Corning on Monday morning before the plant opened. The customer was enthusiastic about the way his order was handled."

YOU can rely upon Scully to handle your orders promptly, accurately and cheerfully . . . whether large or small, regular or rush. So whenever you need steel or steel products, copper or brass, put it up to Scully and know that you'll get prompt action. Thousands of customers have learned that Scully Service is the same at each of our eight conveniently located warehouses. They all operate on the principle that our customers want immediate service and friendly contacts — and they always hurry whether you ask it or not. And when you say "Rush" they know you mean it.

Why not try Scully Service? Phone, write or wire the warehouse nearest you. And ask for our complete and handy Stock List and Reference Book. It's free.

Scully Service

The Mark of Service

ALLOYS
ANGLES, HOT ROLLED and COLD ROLLED
ARCHES (CORRUGATED)
BABBITT
BANDS and HOOPS
BARS, HOT ROLLED
ALLOYS (HR and CF)
COLD FINISHED
ELECTRIC HIGH CARBON STEEL
REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS
BORING and TURNING BARS and GRINDERS
BRACES, BOILER
CHAIN, ALL KINDS
CHANNELS
CHISELS
CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER and BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS
DARDELET RIVET and MACHINE BOLTS
DRILL RODS
EAVE TROUGH and FITTINGS
EXPANDERS, FLUE
FERRULES, COPPER
FLANGES, BOILER and TANK
FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
HEADS, TANK and FLANGE
HOISTS, HAND and POWER
IRON, STAYBOLT
LUGS, BOILER, TANK and SILO
MACHINERY, HAND and POWER
MANHEAD PLATES and FITTINGS
NAILS
PACKING
PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
ABRASION RESISTING
COR-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS
SHAFTING
SHEETS
ABRASION RESISTING
ELECTRICAL
COR-TEN and MAN-TEN
HOT ROLLED and UNIFORM BLUE
WELLSVILLE POLISHED
COLD ROLLED
STAINLESS STEEL
GALVANIZED and GALVANNEALED
LONG TERNE
CORRUGATED
U-S-S COPPER STEEL
SPRING STEEL BARS and SHEETS
STAINLESS STEEL
STRIP STEEL, CR and HR
TEES
TIRE, ROUND EDGE
TOOLS, HAND and POWER for BOILER and IRON WORK
TROLLEYS
TUBES, BOILER
TURNBUCKLES
VALVES, BLOW-OFF
WELDING ROD and WELDERS
ZEES

The Mark of Quality

USS

We have big stocks on hand **NOW** *. . . for immediate delivery*

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON
ST. PAUL-MINNEAPOLIS · CLEVELAND · PITTSBURGH · BALTIMORE

UNITED STATES STEEL

"I Married a Smart Husband He's a G-E Dealer!"

Mrs. D. Kerwin Twomey, wife of successful G-E Dealer of Biddeford, Maine, tells you how she feels about being a member of the great G-E family.

"WHY AM I TALKING about my husband's business? Simply because I'm mighty interested in it. I like it. And I know a lot about it because we've always made it a habit to talk things over together. We're really partners.

"He's proud of his success and I am too!

"As he says, every time he sells a G-E unit he makes another friend. It does the job promised and keeps the customer happy.

"I don't believe I know a soul who hasn't a refrigerator, a fan or something made by G-E. That's why he says it's easy to get to prospects and why they're *sold* on the name and reputation of General Electric.

"And he enjoys working with his distributor and the company representative. They give him a lot of special training and they are always handy when he needs help. They supply him with all kinds of literature and promotion material. And of course he benefits by the grand advertising G-E does.

"G-E Heating is the finest money can buy—

"It's a real blessing in any home. When my husband sells a G-E furnace or any of the other cooling or refrigeration equipment, he *knows* he is giving his customers the finest they can buy.

"I know G-E engineering and research couldn't produce anything but the finest. And that's exactly what my husband tells customers—that *convinces* them.

"He doesn't get called out of bed at all hours because something's gone wrong. He has very little service trouble to worry about. And besides, he's been all through the special technical training provided by G-E. That means installations are right to begin with, and there are few complaints because they *stay right*.

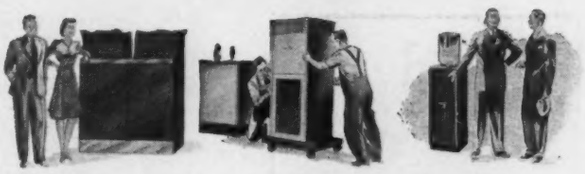
"We live very comfortably

"Of course my husband is in business to make money—and he does. He started in selling G-E Heating and then added Cooling and Commercial Refrigeration. So now he sells the *complete* lines.

"He says they are the most complete lines in the business. No matter what prospects want he usually can supply them. Not only that, he has cut out what they call seasonal slumps, so that when one line is off *two others* keep him busy and keep sales up.

"And with G-E he carries what he calls a skeleton line. This keeps the inventory costs down because he can get whatever he needs in a hurry, from his distributor.

"This gives you some idea what it means to be a G-E Dealer. And there are lots of other reasons too!"



Heating Cooling Commercial Refrigeration

Year 'round prospects—year 'round profits

Three lines—three opportunities for profits. You can be a G-E Dealer if you can fill certain requirements. For year 'round profits, fill in and mail the coupon today.

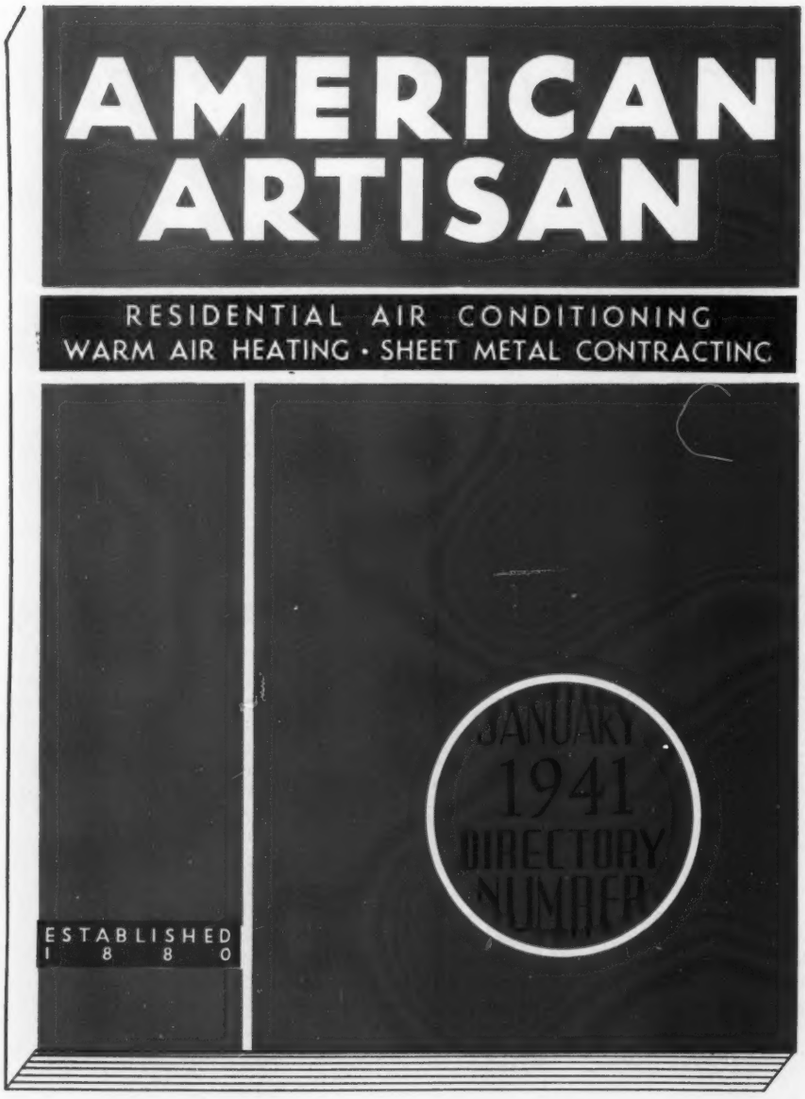
GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY
Div. 199-1253, Bloomfield, N. J.
I want all details on the G-E Dealership for my territory.

Name _____

Street _____

City _____ *State* _____



NEXT ISSUE IS IT..

AMERICAN ARTISAN'S 9th ANNUAL DIRECTORY NUMBER

Send us your reservation ...*NOW!*

•

Closing Date December 20th

More residential air conditioning, warm air heating and sheet metal work will be done, and more equipment needed, in the coming year than in any other year for quite some time . . . and this year, as in the past, buyers will rely on AMERICAN ARTISAN'S complete and correct Directory Section to help them select their product and equipment requirements. This issue is the place to show your ENTIRE LINE. The Directory is used as a year 'round reference and your advertisement will receive maximum attention through our system of prominently "dotting" every advertiser's listings to guide buyers and specifiers to your pages.

Better drop us a note today enclosing your reservation for liberal space to enable you to show your entire line . . . use plenty of color and bleed also, to make your ad REALLY stand out!

CLOSING DATE FOR COLOR FORMS IS DECEMBER 20TH. FOR BLACK AND WHITE FORMS, THE 27TH. Contact your agency today . . . or send us your material and we'll prepare the ad for you . . . no charge, of course.

AMERICAN ARTISAN
6 North Michigan Avenue Chicago, Illinois

THE NEWS BEHIND THE JACKET

of the new

FITZGIBBONS DIRECTAIRE

NEW SIZES—three of them from 65,000 B.t.u./Hr. at bonnet, up to 100,000. This means new small home business for you.

NEW LOW PRICES enabling you to offer Fitzgibbons quality to meet the closely figured budget.

"WELDSEAL" CONSTRUCTION—heavy copper-bearing steel plate electrically welded throughout.

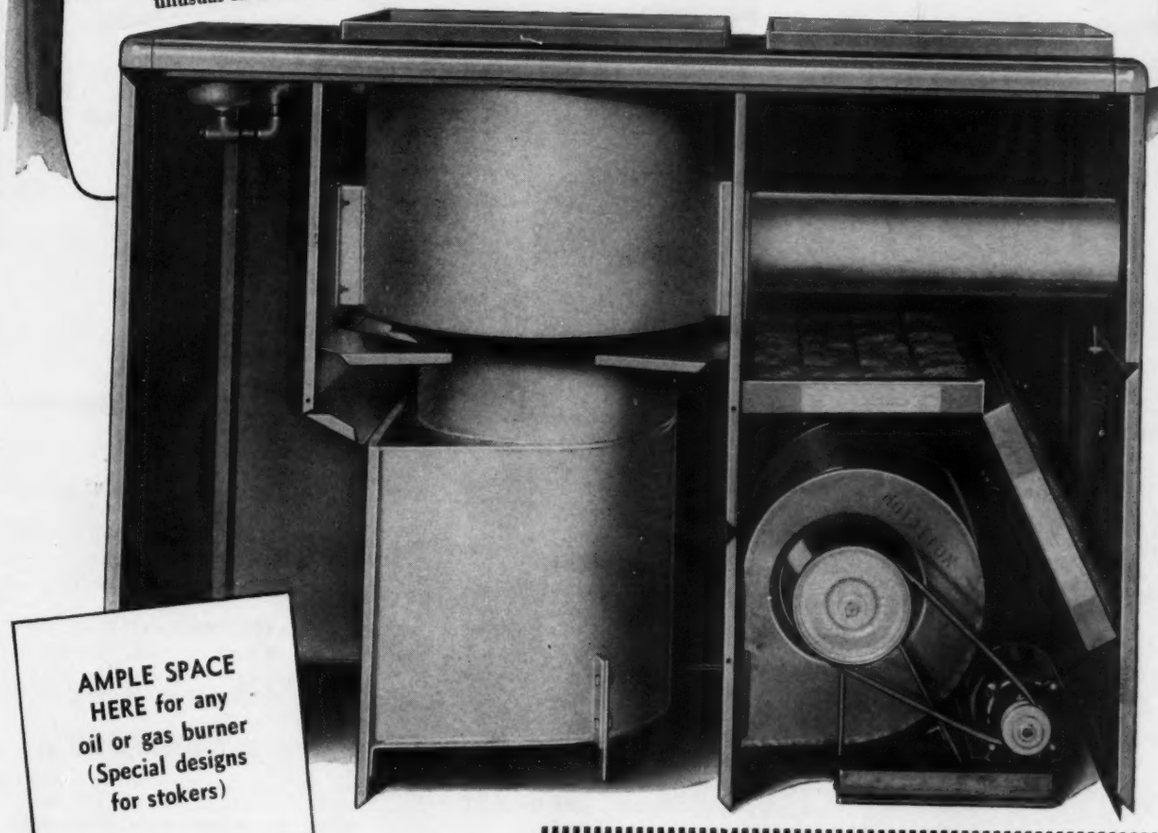
NEW INCREASED HEATING SURFACE unusual in a conditioner of this small capacity.

NEW LOW IN FUEL CONSUMPTION assuring economical and trouble-free conditioned heat for the small home.

NEW QUIETNESS with oversize low speed fan, balanced dynamically and statically, running on roller bearings mounted in rubber.

NEW HUMIDIFIER built-in—positive and automatic in operation, ample in capacity.

AND . . . NEW ALL-'ROUND APPEAL THAT WILL PUT AIR CONDITIONING INTO MORE HOMES, LARGE AND SMALL.



AMPLE SPACE HERE for any oil or gas burner (Special designs for stokers)

new business for you in this complete line of conditioners. Mail the coupon.

FITZGIBBONS BOILER COMPANY, INC. AA-12
101 PARK AVE., NEW YORK, N. Y.

Send me data on the new DIRECTAIRE for small homes.

NAME .....

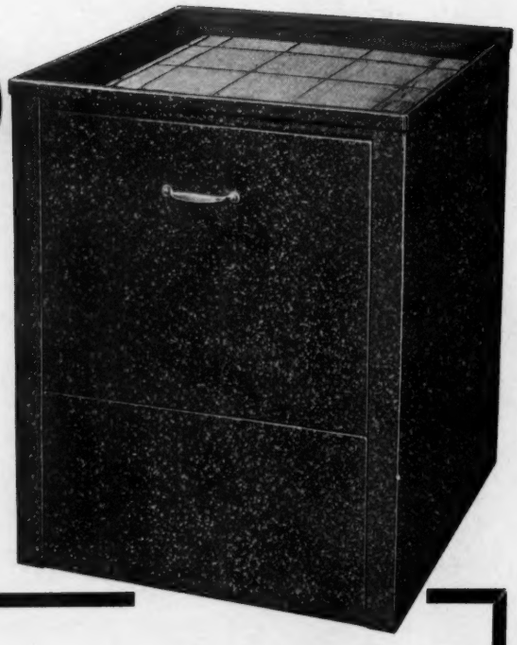
ADDRESS .....

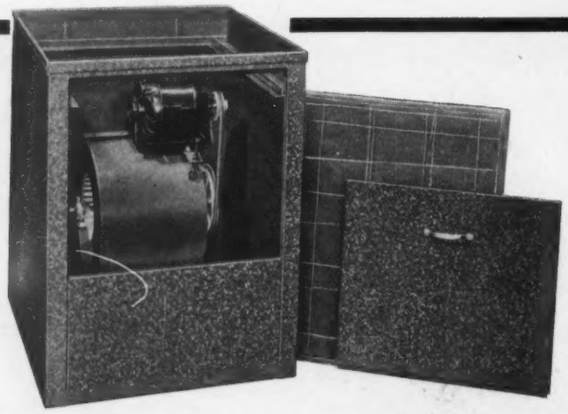
CITY ..... STATE .....

HERE IT IS!

NEW! LAU BLO-ETTE

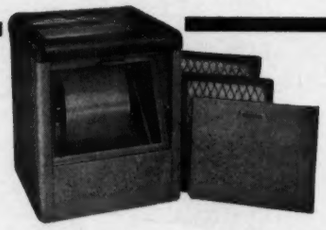
Sensational New Product Opens Up New Sales for You





LARGE ACCESS DOOR

permits easy change of filter, or adjustment of motor, pulley belt and oiling of bearings. Entire unit ultra compact.



NOW FIVE BLO-ETTE SIZES

Larger BLO-ETTE units for the small home market may be obtained. Blower sizes up to 14".

This is the BIG NEWS everyone has been waiting to hear. You've been asking for a blower for five and six room dwellings . . . one that's easy to install . . . is service free . . . will deliver ample air to circulate heat efficiently, quietly . . . and will sell for less with a profit for you.

Lau engineers bring you the answer with this new 400 Series Package Blower. Designed to be produced in Lau's mass production assembly line, it sells at the lowest price in all Lau Blo-Ette History.

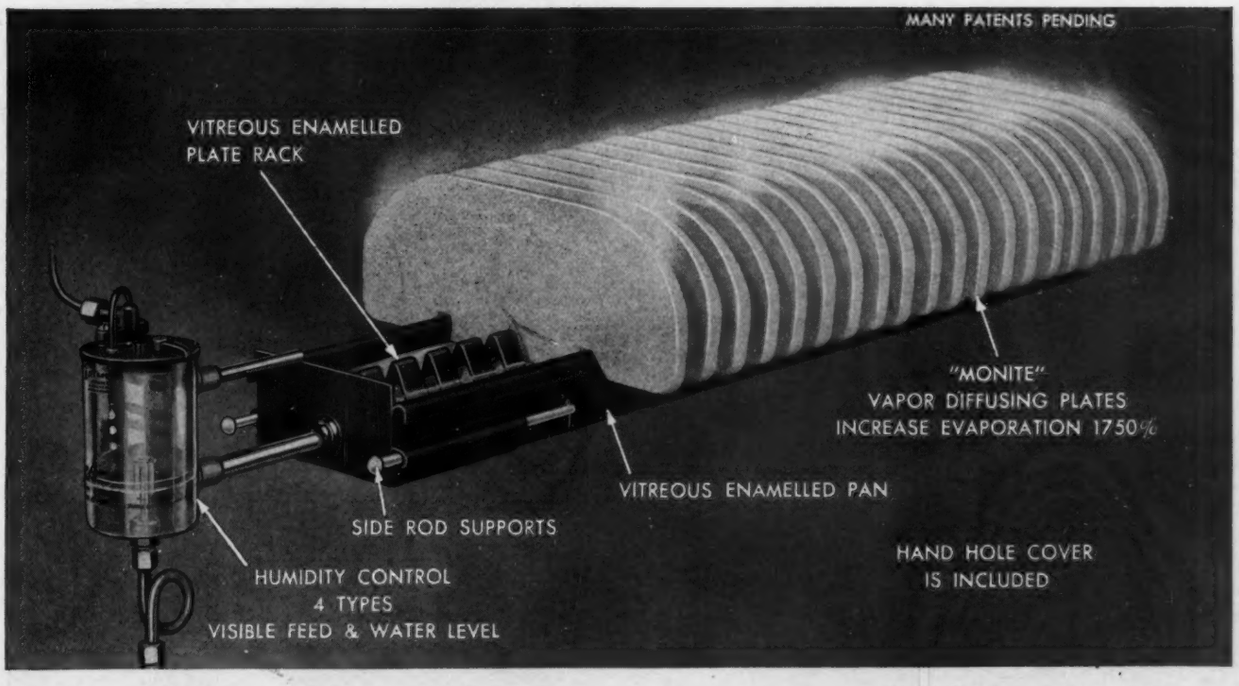
With it you now can sell jobs you never could touch before . . . new low cost homes . . . or unsatisfactory gravity jobs that need modernization. It's a vast new market, and there's real money in it for you!

HONESTLY RATED AT 850 C.F.M. This is a full capacity blower with the same efficient, superbly engineered blower that's made Lau the leader throughout the industry. Rated according to ASHVE test code, it moves more air with less noise and vibration than you'd think possible in such a small unit.

ALL THE FAMOUS LAU BLO-ETTE FEATURES Lau hasn't sacrificed quality one bit to bring you this sensational new 400 BLO-ETTE. You'll be proud to install this smart-looking unit. It's easy to install too, because it's shipped assembled from the factory . . . will go through any door. Large leak-proof filter, big access door (to motor, pulley, and filter), self-aligning, self-oiling pillow block, top motor mounting, and dynamically balanced wheel are some of many other famous Lau features you'll like in this new unit.

Now's Your Big Opportunity to Cash In!

Be the first in your town to offer the new 400 BLO-ETTE. Write today for complete information and engineering data.



Monmouth Capacity Unequaled

Monmouth Vapor Diffusers range from 2¼ to 50 tons capacity per year. The model illustrated has a peak capacity of 7½ tons of water per season.

No other humidifier can challenge this efficiency which is more outstanding in 1940 than ever before due to the new Monite plate formula. *Three plates now do the work of four.* Each plate is equivalent to 70 sq. inches of water surface.

This means that, for the first time, even small cramped impossible-to-get-into furnaces can now embody proper humidification capacity.

★ ★ ★ ★

FREE—

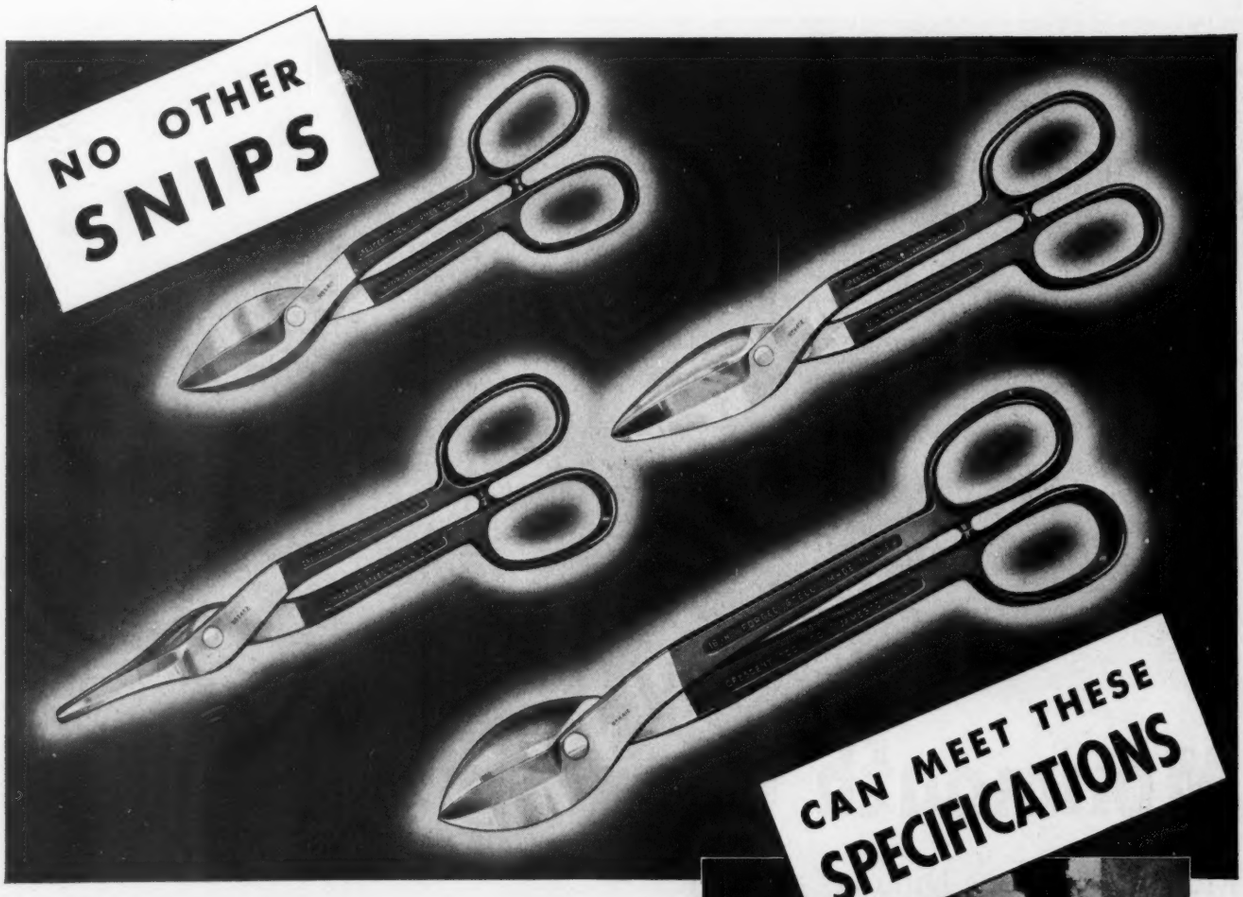
Humidifier Capacity Indicator

Will you accept our gift of a scientific Monmouth Capacity Indicator? This handy easy-to-use instrument tells you exactly how much humidification capacity is needed on any given job. You can become an expert overnight. This simple but scientific indicator will be sent FREE to any heating man. Write today.

MONMOUTH PRODUCTS CO.
1933 E. 61st St. Cleveland, Ohio

MONMOUTH

The Greatest Name in Humidification



● Actually, no other snip made can measure up to Crescent's rigid specifications, because Crescent Snips are manufactured by *methods* and *equipment* that are exclusively Crescent's!

First of all, Crescent blades are *not* inlaid. They are a solid forging of special-analysis steel. They are hardened all the way through, providing a tough, keen edge that no amount of grinding can ever remove. And Crescent blades are not merely *sprung* to provide cutting tension at the tip—they are *ground* to permanent shape.

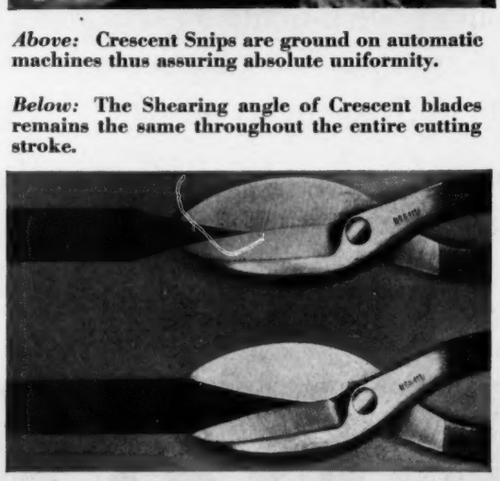
But the secret of Crescent's most conspicuous advantage—effortless cutting throughout the entire stroke—lies in Crescent scientific blade contour. The shearing angle is the same at the finish as at the start of the cutting stroke. That's why Crescent Snips cut with surprising ease right out at the blade tips.

There is a Crescent Snip for every type of service—4 patterns, 9 sizes. Make these fully-guaranteed snips your choice.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

Above: Crescent Snips are ground on automatic machines thus assuring absolute uniformity.

Below: The Shearing angle of Crescent blades remains the same throughout the entire cutting stroke.



CRESCENT and Smith & Hemenway TOOLS

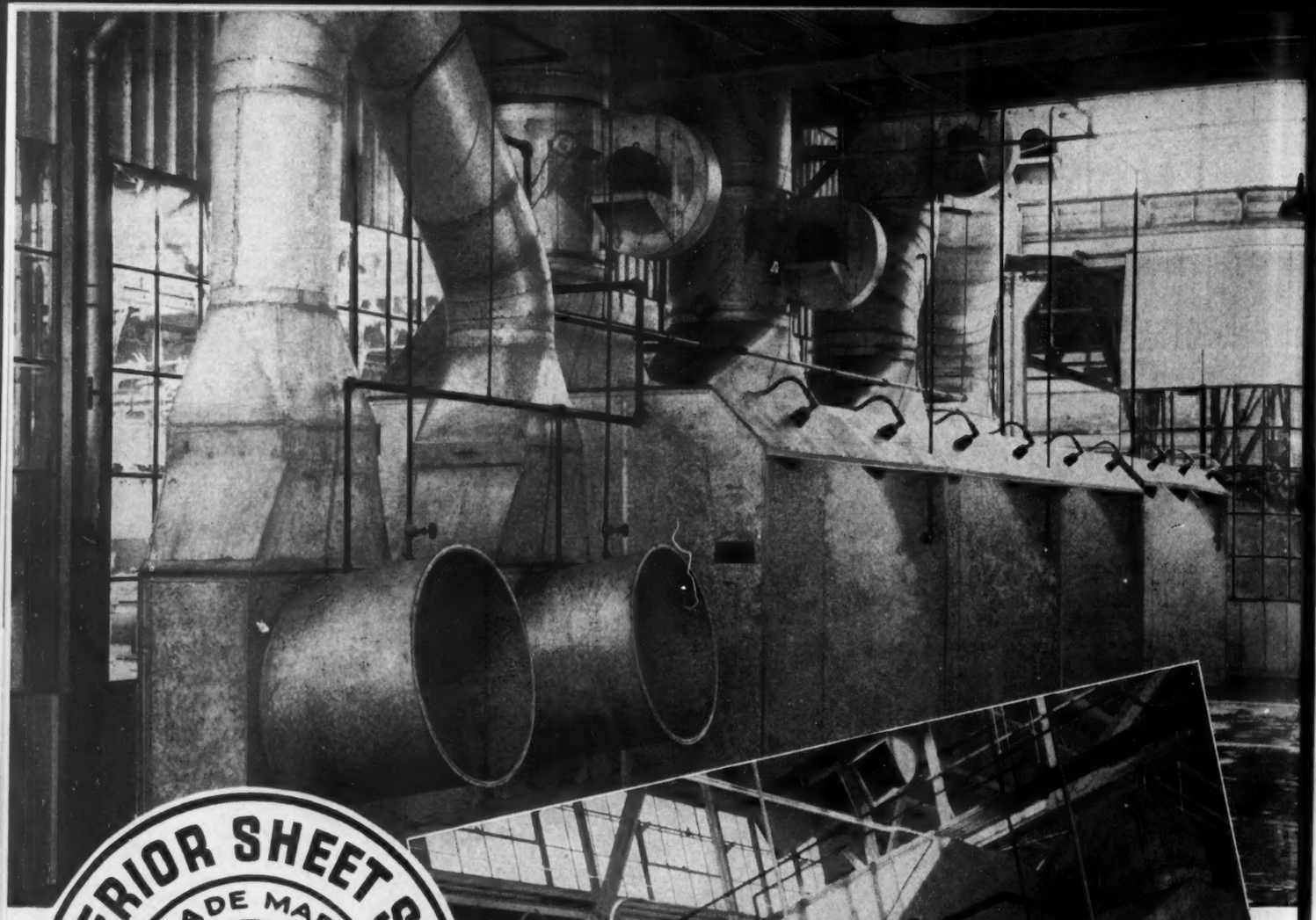
YOU'RE *Sure* OF ACCEPTANCE WHEN YOU STANDARDIZE ON M-H *Controls*

THE SYMBOL OF *Today's* AUTOMATIC HEATING

IT is a known fact that Minneapolis-Honeywell Controls are easier to sell than any other. So when you standardize on Minneapolis-Honeywell, you remove any possible objection to the controls in the sale of your automatic heating equipment, because M-H Controls are accepted the world over. You also know you are giving your customers the best control equipment money can buy. The new Minneapolis-Honeywell Chronotherm is the last word in temperature control and at its new low price is now practical for every job even though price is an important factor. Take advantage of the Minneapolis-Honeywell reputation and standardize on M-H Controls. They cost little if any more. Minneapolis-Honeywell Regulator Co., 2726 4th Ave. S., Minneapolis, Minn. Canadian Plant: Toronto. European Plant: London. Company owned branches in 49 cities.

MINNEAPOLIS-HONEYWELL

CONTROL *Systems*



THE SUPERIOR SHEET STEEL CO. TRADE MARK REGISTERED CANTON, O.

BIG JOBS.. a BIG NAME

There is a name known everywhere among sheet metal men for the quality it implies. That name is SUPERIOR. For many years Superior Steel Sheets have been favorites among sheet metal workers because of their fine workability and uniform clean appearance. If you want a sheet that's soft annealed, flat and level, Superior coated and uniform throughout, specify SUPERIOR.

THE SUPERIOR SHEET STEEL CO.

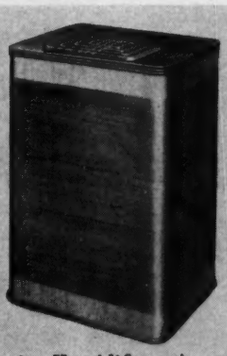
Canton, Ohio

DIVISION OF CONTINENTAL STEEL CORP., KOKOMO, IND.

SUPERIOR

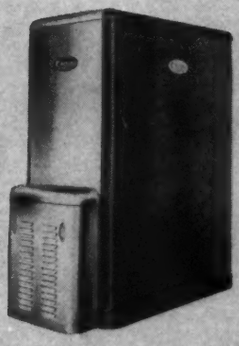
OPEN HEARTH STEEL SHEETS

LOW-COST EQUIPMENT BY CARRIER

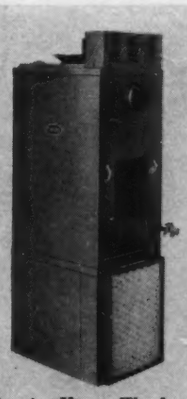


Carrier Humidifier: A new and profitable specialty. Adds adequate healthful humidity to dry, air-parched homes, offices, apartments.

Carrier Room Ventilator for low-cost year-'round comfort and hay fever relief. Sales steadily increasing to homes and offices.

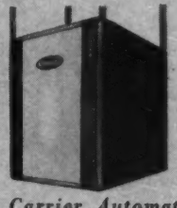


The Carrier Home Weathermaker in larger capacities for medium and large size homes. Available for oil, gas or stoker-fired coal. Summer cooling may be added.



Carrier Home Weathermaker—Real Winter air conditioning for smaller homes—with Carrier quality throughout. For automatic comfort with oil or gas.

Carrier Oil Burner—backs your complete automatic heating line with the same famous name. Designed by Carrier experts for utmost economy and dependability.



Carrier Automatic Furnace for radiator systems . . . plus the Home Air Conditioner, provide de luxe dual-system comfort for larger homes. Available for oil, gas or stoker-fired coal.

Some Territories are Open for this Complete Line

backed by the reputation of AIR CONDITIONING'S FIRST NAME!

• There's no competition for the man who handles the complete line of Carrier Home Equipment. He's ready for *today's* business of automatic heating and winter air conditioning — and he's prepared for *tomorrow's,* when he'll be selling *year 'round comfort* — cooling, as well as heating.

That is why progressive heating men are welcoming this sensational opportunity to tie up with Air Conditioning's *first* — and most *famous* — name . . . Carrier . . . to get in on the ground floor with a complete line of home equipment.

For Winter and Summer Profits

Among the new equipment in Carrier's complete line of automatic heating and winter air conditioning with oil, gas or stoker-fired coal are:

- **New low-cost, low-capacity Oil Burner**
- **New low-cost Boiler-Burner Units**
- **New low-cost Direct-Fired Units**

In addition, the famous Carrier Room Weathermaker for summer cooling, the low-priced Carrier Room Ventilator and the new Carrier Humidifier — all of them available on Carrier's sensational new dealer franchise — will add to year 'round business and profits. You'll learn the cooling end of the business from the leader of the industry!

No matter what line you carry now, it will pay you to investigate the new Carrier Dealer Plan. Write or wire today for complete information. Or mail the coupon.

AIR CONDITIONING'S

First Name— **Carrier**

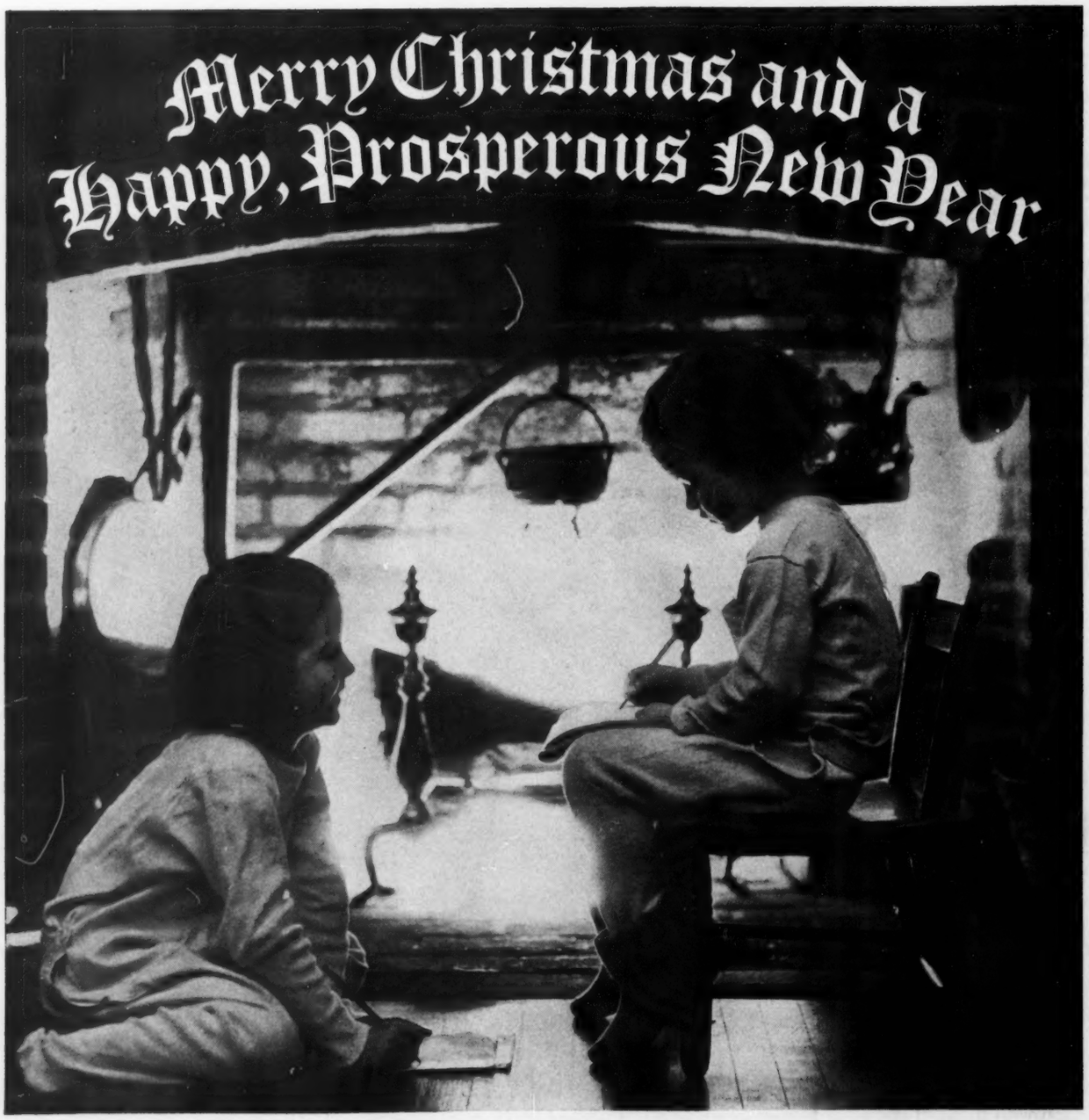
CARRIER CORPORATION, Syracuse, N. Y.
"Weather Makers to the World" Desk L 33
(In Canada, 30 Bloor St. West, Toronto, Ont.)

Please send me complete details on the new Carrier Dealer Franchise.

Name.....

Company.....

Address.....



It may be a little early, perhaps,
but we like the idea of being among
the first to extend you the
Season's Greetings.

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO
BUFFALO • CINCINNATI • DETROIT
Manufacturers—Distributors of Metals and Metal Products

A DEPENDABLE SOURCE OF SUPPLY FOR 82 YEARS

Not a Penny for Repairs in

47 YEARS

Record of copper cresting on Home Life Insurance Building leads to re-roofing with 20-oz. Anaconda Copper . . . and a saving of 25 tons in weight!

When horse-cars labored down Broadway and "Gentleman Jim" Corbett wore the heavyweight crown, a new building reared its copper crest along Manhattan's budding skyline; the year, 1893. Since then, not one cent has been expended for repairs to the copper cresting. Such a record naturally led to the choice of copper to replace the old tile roof.

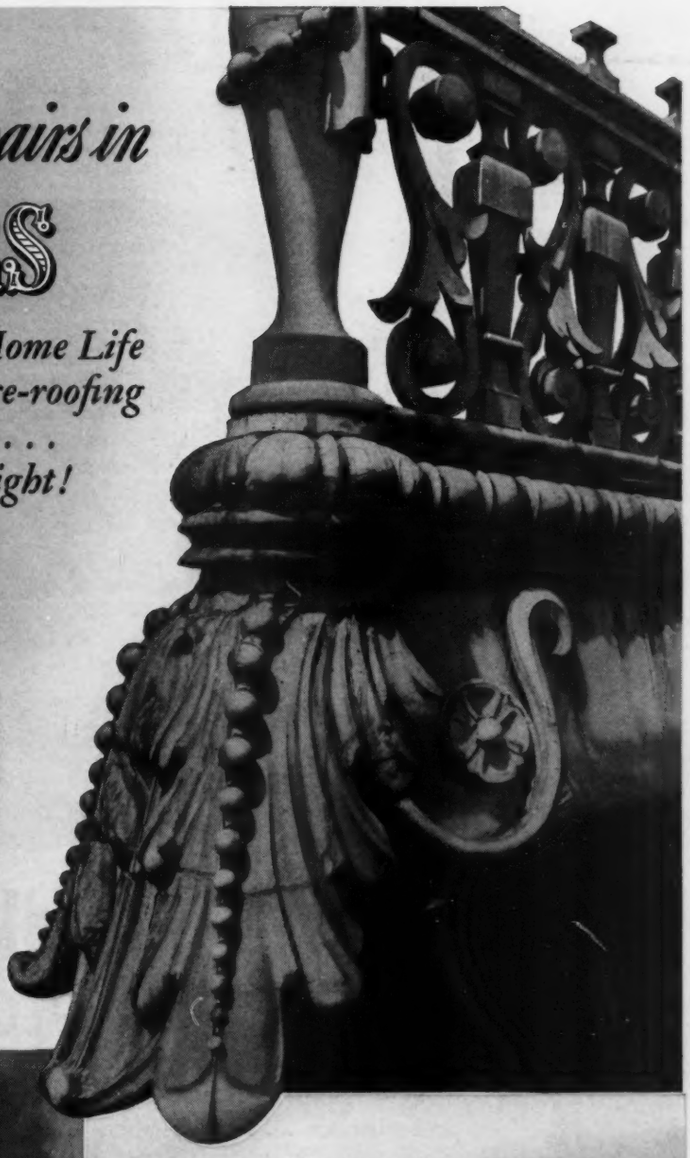
Unique Installation

Interesting is the fact that not a bit of solder was used in installing the new copper roof; also that Nicholson & Galloway, Inc., did both the cresting job in 1893 and the new batten-seam roof in 1940!

Specify Anaconda Copper

You can't go wrong with Anaconda Copper. Specify it for light weight, good appearance, durability. In the long run, it saves money.

4044



The Home Life Insurance Company, now in its 81st year, built New York's first fire-proof, all-steel constructed building in 1893—at 256 Broadway. The original copper cresting is still in good condition after 47 years of rain, sleet, snow and burning sunshine.

(At left) 20-oz. crimped Anaconda Copper batten-seam roof recently installed without solder on this roof by Nicholson & Galloway, Inc., New York. The architect was Samuel R. Bishop, New York.

ANACONDA
from mine to consumer

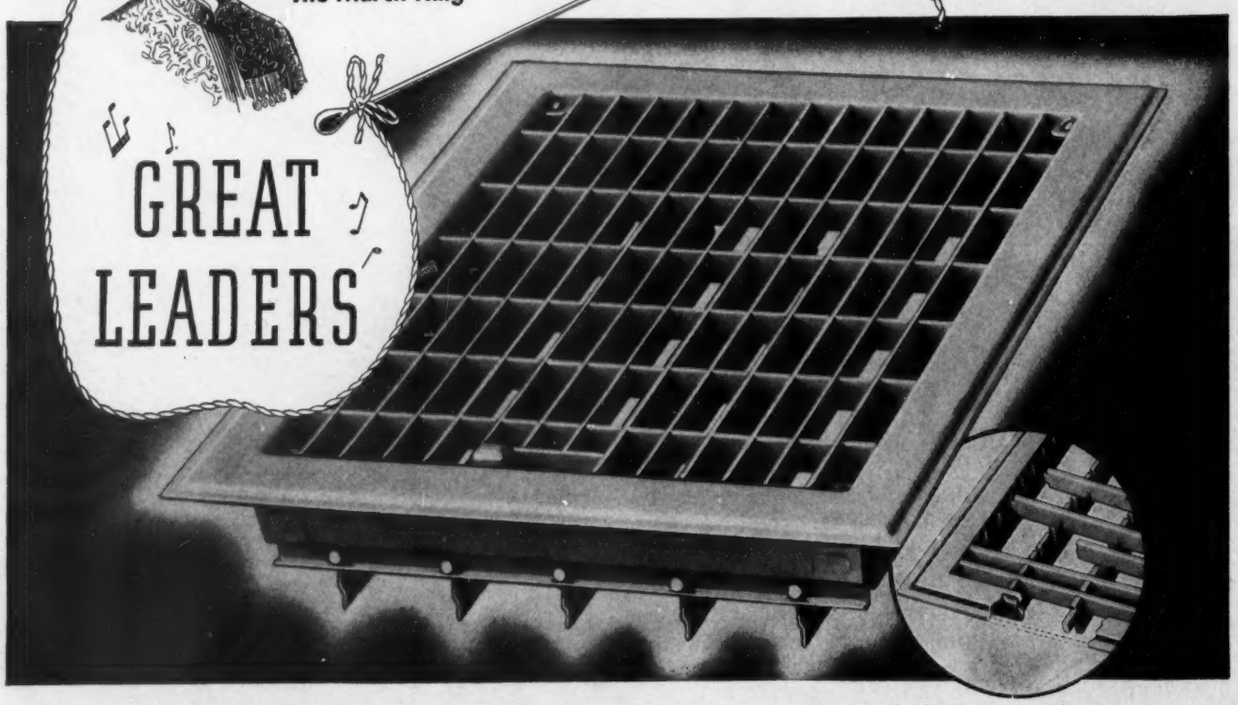
Anaconda Copper

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.
Subsidiary of Anaconda Copper Mining Company

JOHN PHILIP SOUSA
The March King

Among the many famous band leaders America has produced, Sousa stands foremost in the public's estimation, veritably a leader of leaders.

GREAT LEADERS



Steel strips set on edge composing the grille are forced together under tremendous pressure. Ends are clinched outside the frame so that each member is a sustaining unit.

INDEPENDENT "Fabrikated"

... THE KING OF REGISTERS

● "Fabrikated" construction embodies all the qualities that make for preeminence . . . large open area, great strength and rigidity, and fine appearance. Independent "Fabrikated" Registers and Cold Air Faces are correctly designed and carefully made of quality materials. Engineers can specify and contractors install them with the assurance that they will give the fullest degree of satisfaction in every particular. Whatever the requirement in either a gravity or an air conditioning installation, you can meet it best with Independent "Fabrikated."

SEND FOR CATALOGS

THE INDEPENDENT REGISTER CO.
3747 E. 93rd STREET • CLEVELAND, OHIO

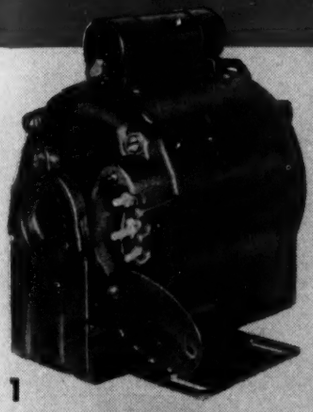
740

INDEPENDENT "Fabrikated" (REG. U.S. PAT. OFF.)
FLOOR REGISTERS AND COLD AIR FACES
AND AIR CONDITIONING REGISTERS AND GRILLES

WAGNER MOTORS

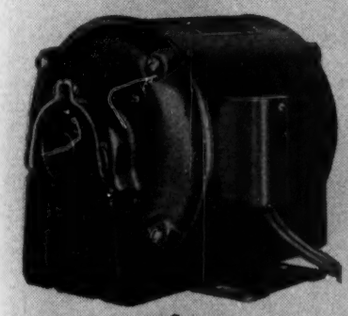
are correctly engineered for every type of air-conditioning equipment—

No matter what type of air-conditioning equipment is involved . . . whether large or small . . . regardless of the torque, speed or current requirements, you can choose a motor from the Wagner line that is correctly engineered for the job. The 8 motors illustrated represent the types of Wagner motors most frequently used in air-conditioning work. Each motor has special electrical or mechanical characteristics that make it the ideal motor for certain applications.



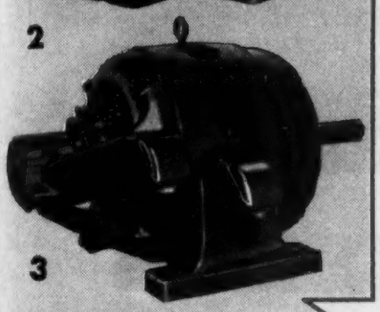
1

TYPE RK, CAPACITOR-START INDUCTION-RUN motors are suitable for driving refrigerators, household air conditioners, and other appliances. Drip-proof or totally-enclosed endplates; rigid or resilient mounted; 1/8 to 3/4 hp.



2

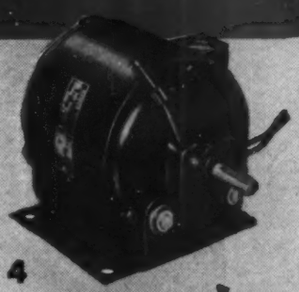
TYPE RA, REPULSION-START-INDUCTION motors are single-phase brush-lifting motors having high starting-torque and low starting-current. The ideal motor for heavy duty applications such as stokers, compressors, pumps, etc. Obtainable in various speeds, frequencies, and voltages; rigid or resilient mounted; 1/8 to 15 hp.



3

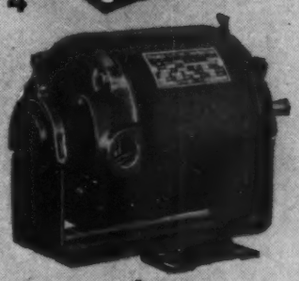
TYPE RS, WOUND ROTOR (SLIP-RING) motors have adjustable varying speeds and combine the ability to start extremely heavy loads with good running characteristics. Smooth starting and adjustable varying speeds are effected by the use of external resistors. 1 to 250 hp.

TYPE M, SHADED POLE FAN motors are single-phase induction motors of simple construction. Ideal for fan and blower drives in which the fans are mounted directly on the motor shaft. Totally-enclosed and open-type; rigid or resilient mounted; 1/250, 1/125, 1/80, 1/40 and 1/30 hp.



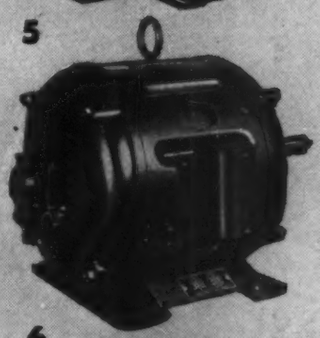
4

TYPE TB, SPLIT-PHASE UNIT HEATER motors are totally-enclosed to prevent entrance of dust or moisture; ball-thrust bearings on front end to take care of end-thrusts imposed by fans; rubber mounted for ultra-quiet operation. 1/20 to 1/4 hp.



5

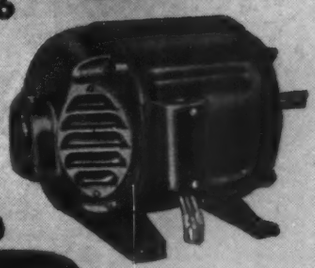
TYPE RP, SQUIRREL-CAGE motors are made in 7 electrical types varied as to torque and current characteristics to take care of a wide variety of applications. 2 and 3 phase; 1/6 to 400 hp.



6

TYPE RD, DIRECT CURRENT motors may be used for direct current service wherever repulsion-start-induction, split-phase, capacitor, or squirrel-cage motors would be used for alternating current service. Built in two types: Appliance type up to 1½ hp; Industrial type, 2 and 3 hp.

TYPE RT, SPECIAL COMPRESSOR motors were developed to meet the demand for a motor with high starting-torque and very low starting-current. The RT motor is ideal for large compressors. The very low starting-current permits across-the-line starting. 2 and 3 phase; 40 to 100 hp.



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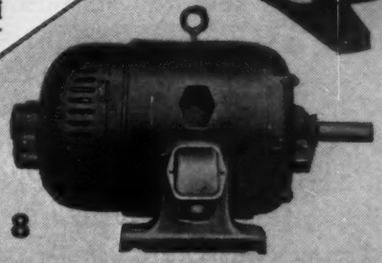
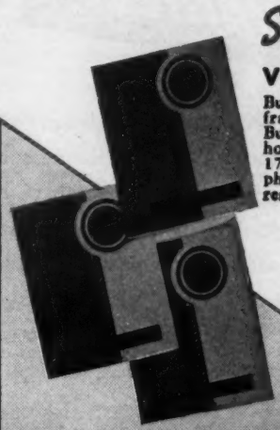


8

Send FOR THESE VALUABLE BULLETINS

Bulletin MU-177 covers Wagner fractional horsepower motors; Bulletin MU-182, Wagner integral horsepower motors; Bulletin MU-179, Wagner single-phase and direct-current motors.



WAGNER COOLING AND VENTILATING EQUIPMENT

Wagner builds a complete line of cooling and ventilating equipment, including home cooler (attic) fan, apartment ventilators, wall box ventilators, window ventilators, ring-mounted ventilators, pressure type exhaust fans, air-circulators, ceiling fans, desk and pedestal fans, all described and illustrated in Bulletin FU-22, sent free upon request.

Wagner wall box ventilators are designed for permanent installation in the kitchen or bathroom wall—for removing cooking odors, smoke, grease-laden air or other undesirable air.

Wagner pressure type exhaust fans are designed to operate against ordinary pressure heads. Capacities 1,000 cfm to 6,700 cfm.

Wagner home cooler (attic) fans—for cooling homes, offices, industrial and commercial buildings. Capacities 7,000 cfm. to 20,000 cfm.

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, Mo. U.S.A.

M40-35 AA

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, U.S.A.

Gentlemen: Please send me FREE bulletins

☐ MU-177, ☐ MU-179, ☐ MU-182, ☐ FU-22.

Name_____

Firm_____ Position_____

Address_____

City_____ State_____

MOTORS • TRANSFORMERS • FANS • BRAKES

BETHLEHEM GALVANIZED SHEETS

An example of work from which enterprising sheet metal contractors take many a dollar the year 'round is this ductwork for a combination air-heating, air-cooling and air-conditioning system in a small neighborhood theatre. When it's finished, this main duct will carry either hot or cold air across the roof to the various distributing ducts leading to vents in the auditorium itself.

There are undoubtedly jobs like this one waiting to be done in your locality. They may be for new heating, cooling and conditioning installations or to replace poorly designed, inefficient ductwork. You can get such jobs by knowing where to look—and looking. Once you've lined up a job like this, safeguard your profit with Bethlehem Galvanized Steel Sheets as this contractor did. They're easy to work, uniformly high in quality. For double protection of your client's investment, use Beth-Cu-Loy Copper-Bearing Galvanized Steel Sheets.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

A Family of Plus-Profit Makers

MONCRIEF

SQUARE CASED

Gravity

FURNACES

DST Steel Stoker-Fired Gravity Furnace

Series "C" Cast or Series "S" Steel Gravity Furnace

DeLuxe Long Life Cast or Steel Gravity Furnace

Here they are all ready to go to work for you—

ALL alike in their modern square casings, beautifully finished in smooth hard enamel. Yet all different, for these square casings enclose a variety of furnaces, giving you just the unit to fill any demand—Series "C" cast . . . Series "S," "D-40," or "E" steel . . . DeLuxe Long Life, cast or steel . . . Series "DST" specially built for stoker firing.

And all alike in their bigger profit possibilities. These smart Moncrief square casings sell quicker, allow a wider profit margin, and give the homeowner a gravity furnace styled for the times. Remember, a blower-filter unit of the same finish may be added later if desired.

Send for circulars on these and other units of the complete Moncrief line.

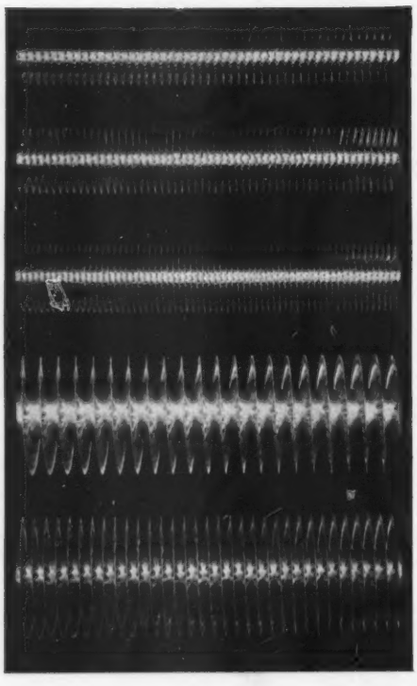
THE HENRY FURNACE & FOUNDRY CO.

3473 E. 49th STREET **CLEVELAND, OHIO**

Manufacturer of Moncrief Cast and Steel Furnaces and Moncrief Winter Air Conditioners for Coal, Gas, or Oil, styled in round cornered rectangular casings.

Moncrief Supplies Everything Used on a Warm Air Heating and Air Conditioning Job

AEROFIN



● Extended fin surface for more effective heat transfer ● Tin and lead coated against corrosion and for continuous heat flow ● Aerofin cooling and heating coils are finned and coated for your protection.

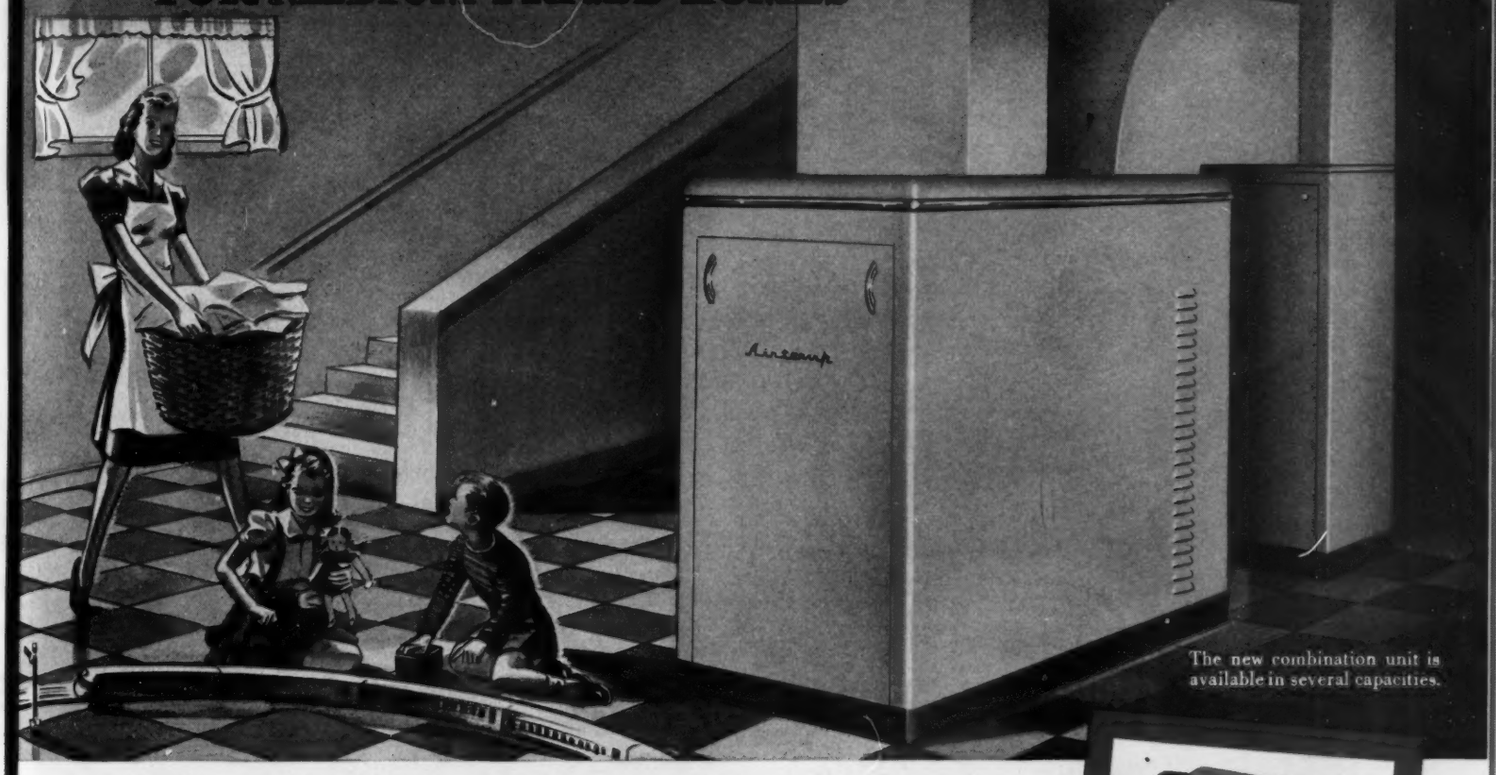
● Where long life, increased efficiency, instantaneous heat transfer, and permanently protected, metallic bonding are factors of importance, specify Aerofin Coils.

AEROFIN CORPORATION

410 S. GEDDES ST., SYRACUSE, N. Y.

CHICAGO • DETROIT • NEW YORK • PHILADELPHIA • DALLAS • CLEVELAND • TORONTO

A NEW COMBINATION HEATING AND COOLING UNIT FOR MEDIUM PRICED HOMES



The new combination unit is available in several capacities.

A Sales Leader in the Airtemp Dealer's Complete Heating and Air Conditioning Line for 1941

At last a practical summer *and* winter air conditioning unit for medium-priced homes! This compact, efficient installation is going to mean many profitable sales for Airtemp dealers in 1941. The same blower, filters, and ducts which circulate, clean and distribute warm air in winter are used in summer to cool the home. When you tell home builders they can buy the winter air conditioning unit separately and later install cooling at modest cost, you are going to sell a lot of furnaces against competition which cannot offer this advantage!

This new unit is typical of the sales appeal of the entire Airtemp line for 1941. Every Airtemp unit has many exclusive features —the result of Chrysler's policy of providing Airtemp dealers with a most modern and complete line of heating and air conditioning equipment.

When You Are a Chrysler Airtemp Dealer

1. You represent a company that has always given its dealers a money-making opportunity.
2. You sell products of a nationally known company famed for engineering leadership.
3. You have the prestige of Chrysler Corp. which means goodwill and public confidence.

TWIN AIRFLOW OIL BURNER
Exclusive features: compact; cushioned-power mounting; contact heat provided by the famous "flaming ring".

Get Set For 1941 ✓

Tie up with Chrysler Airtemp and build a permanent, profitable, year-around air-conditioning business. Send for full information at once!

Oil, Gas and Coal Furnaces • Hot Air, Hot Water and Steam Systems • Oil Burners • Room Coolers • Packaged Air Conditioning Units • Complete Central Cooling Systems

CHRYSLER AIRTEMP

AIRTEMP DIVISION OF THE CHRYSLER CORPORATION, DAYTON, OHIO

AIRTEMP DIVISION, CHRYSLER CORPORATION, DAYTON, OHIO.

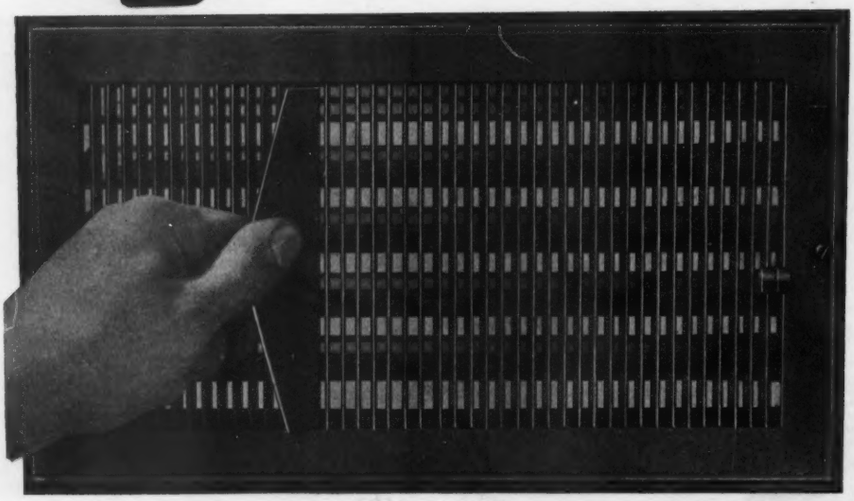
I am interested in receiving complete information on the Chrysler Airtemp combination heating and cooling unit.

*Name*_____

*Address*_____

*City*_____ *State*_____

U S WISHES YOU A ★★★ Merry Christmas



FOUR-WAY FLOW FLEX-BAR LINE — Low Cost and definitely Answers all Problems of AIR-DISTRIBUTION.

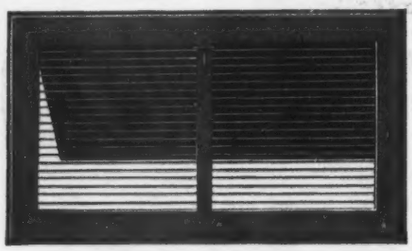
STYLE 256 — Sidewall Type. STYLES 267 and 272 —Baseboard Types.

Grille-Bars are Bendable to any Desired Adjustment.

A GUARANTEED PERFECT REGISTER. Write for New Revised List Prices.

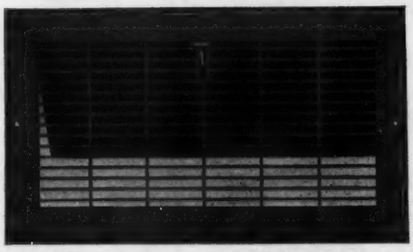
CLASS AND PRICE FOR THE MORE COMPETITIVE JOBS

U. S. LOUVER-TYPE A-C REGISTERS



U. S. Louver-Type A-C Registers are made in ALL STYLES for Base and Sidewall Locations. Lower Cost with Non-Vision and Directional Air-Flow Features.

STYLE 103-N PERFORATED A-C REGISTERS



A Line for the Low-Priced Air-Conditioning Job—HAS NO Quality Rival at the Price Offered.

...AND DON'T FORGET OUR GRAVITY LINES...

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The snug fitting U. S. Trusteel Register with heel-proof spacing and natural photographic wood grain finish sets a new high standard of craftsmanship.

EMBOSSED

The U. S. Steel Embossed Register — "world's strongest" —is favored everywhere for jobs demanding a really serviceable register or smooth appearance and adequate capacities.

COLD AIR FACES TO MATCH

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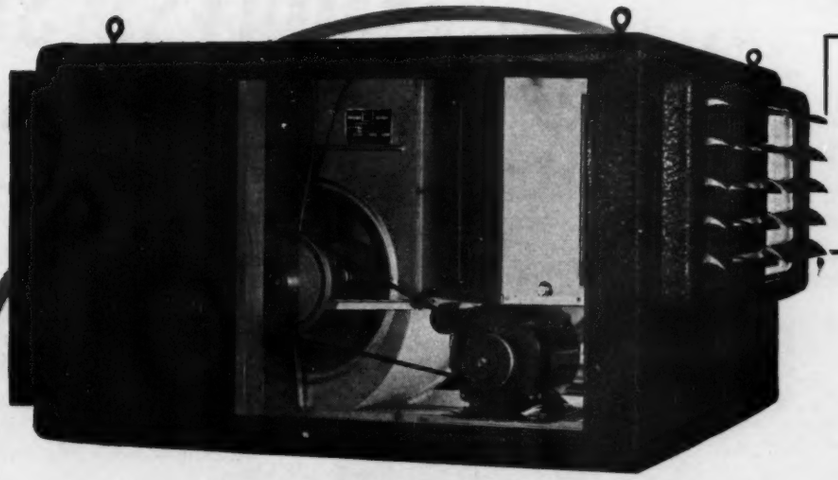
GET THE CENTURY "SPECIFIC PERFORMANCE" MOTOR THAT FITS YOUR JOB



Century ½ horsepower Capacitor Motor driving a blower.

for

Improved Blower Performance

specify Century

CAPACITOR MOTORS

● In thousands of installations throughout the country, Century Capacitor Motors have proven their ability to contribute to improved performance of fans and blowers—for they are engineered to fit this specialized type of load.

Century Capacitor Motors provide the advantages of: *quiet starting,* as motor noise is reduced to a minimum; *quiet acceleration,* that quietly brings the load up to speed; *quiet operation,* that eliminates motor hum at points of air discharge; *cushion base mounting,* that isolates possible vibration from your installation.

For many years, Century has specialized in the problem of air conditioning and refrigeration motorization. Century has developed specialized motors to meet the exacting requirements of this important industry.

There's a Century Motor, from fractional horsepower sizes to 600 horsepower to properly fit any air conditioning, refrigeration or power heating installation. Consult the Century Motor Specialist in your locality—you'll find his experience in correct motor selection and application extremely valuable to you and your customers.

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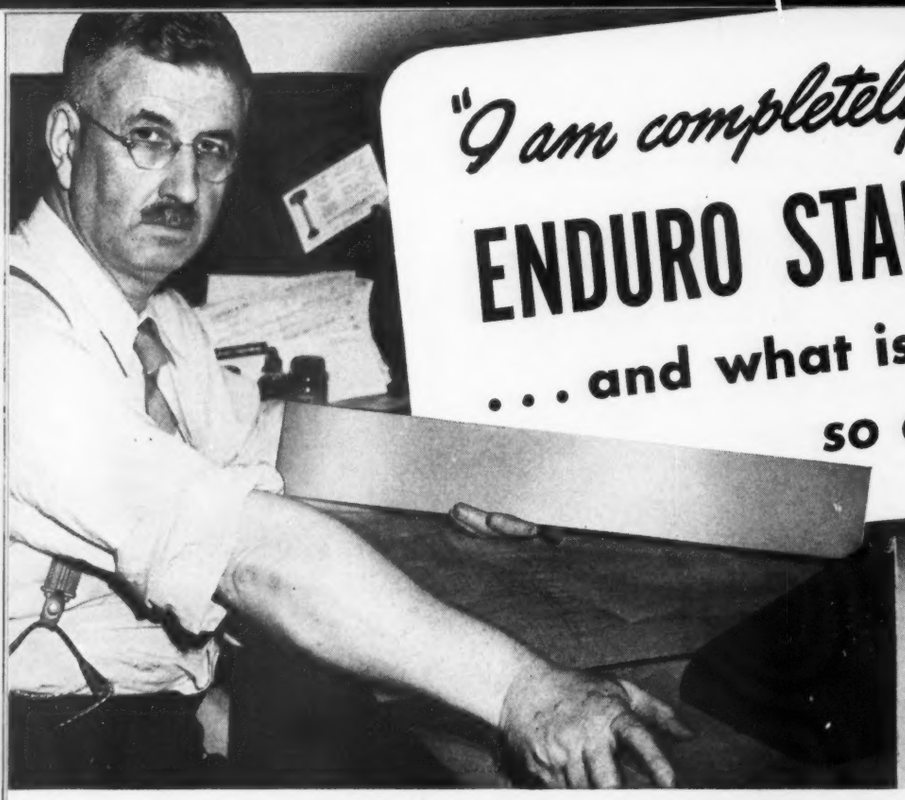


"I am completely satisfied with ENDURO STAINLESS STEEL ... and what is more important, so are my customers"

Is stainless steel a key to sheet metal profits? Mr. R. A. Mouron, who with his two sons, Percy and Bob, and his daughter Ann, operates Mouron & Company, 1435 N. Illinois Street, Indianapolis, Indiana, says: "As far as I am concerned, it is." Read the rest of his statement below—it will give you something to think about.

Reading Time: one minute, 25 seconds

"My first experience with stainless steel occurred about 12 years ago when I sold an order to a large drug manufacturing concern for fruit juice coolers and storage tanks. The customer's specification said: REPUBLIC ENDURO* STAINLESS STEEL. After I had worked it, I realized that here was a metal that was 'going places.'

"Since then, I have done quite a few stainless steel jobs. Today, my business is largely ENDURO Stainless Steel. I specialize in equipment such as bun warmers, sandwich bars, milk coolers, drinking fountains, sterilizing cabinets and drains.

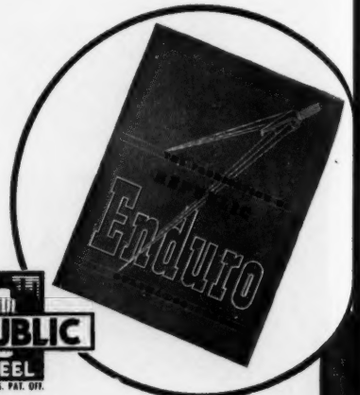
"On a few occasions, I have tried other makes of stainless steel, but I've always come back to ENDURO. Why shouldn't I? I am completely satisfied with it and, what is more important, so are my customers.

"A refrigerated sandwich block we recently made for a local restaurant is an excellent example of customer satisfaction. It was a beauty—all ENDURO and economically priced. Two hours after we had installed it, $40.00 worth of sandwiches had been delivered across its gleaming surface. This business, of course, pleased my customer.

"Naturally, I feel that the craftsmanship of our shop has had a lot to do with our success. We have developed our own technique, but we never have found stainless steel difficult to fabricate. We use ordinary sheet metal equipment. While more care is perhaps necessary, actually it simply is a matter of using your head.

"Right now my shop is behind on orders for equipment made from Republic ENDURO Stainless Steel. While I have no desire to 'toot my own horn,' it does make a fellow feel pretty good to know that his work is so highly regarded that customers are willing to wait for delivery."

If you would like to know how to fabricate Republic ENDURO Stainless Steel with ordinary sheet metal equipment, send for a copy of the ENDURO Fabrication Booklet, No. 322. It will be sent free to any sheet metal contractor or craftsman who writes Republic Steel Corporation, Alloy Steel Division, Massillon, O.—or General Offices, Cleveland, O.



*Reg. U. S. Pat. Off.

REPUBLIC ENDURO *Stainless Steel*

REPUBLIC STEEL
REG. U. S. PAT. OFF.

BERGER MANUFACTURING DIVISION
NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION
UNION DRAWN STEEL DIVISION
TRUSCON STEEL COMPANY

Vol. 109 American Artisan No. 12

Rearmament Housing is Our Really "Big" Market

THE construction of the camps, posts and cantonments which will house this nation's new "peoples' army" is speeding to completion and soon hundreds of thousands of young Americans will be housed for the winter in warm air heated barracks.

But the erection of housing for the hundreds of thousands of civilian workers in the factories engaged in rearmament work; of housing adjacent to camps and cantonments for the families of "men in the army"; of housing sorely needed in "boom towns" and towns which are yet only paper drawings is only now beginning to take definite pattern.

As a market for the products and services of the warm air heating industry, this second phase of the rearmament program far surpasses the camp construction in variety of types and sizes of furnaces; in the number of contractors who will likely install these furnaces; in the final number of heating systems which will be sold and installed.

As Mr. Kruckman points out so strikingly in this month's Washington Letter, there are already many communities where war industries workers are forced to double-up, even triple-up for lodging; where hundreds must live in trailers, tents, etc.; must commute many miles to work from adjoining communities; where—in short—sufficient housing simply does not exist. Quite likely, if present pressure maintains, this scarcity of housing will continue until some gigantic house building program is undertaken. The machinery for such an undertaking is already in motion—the agencies which will finance and control the program are organized and we should expect to see very shortly a house building boom surpassing all previous experience.

This house building program can be undertaken in two ways. If we follow a short-sighted policy of "throwing 'em up" to relieve present distress without giving thought to the future, the houses will be emergency measures—and so will be every product which goes into their construction. Very likely, we may find a few years hence that some communities will contain hundreds of these houses which cannot be rented, sold or filled and which will then be a stone around the neck of all house building in those communities.

It is interesting to note that some groups in some cities are well aware of this possibility and already have announced that no boom construction will take place in their cities if they can avoid it. That all houses built for the war emergency will be of a type and quality which will insure a substantial house which can be rented or sold after the emergency army may have gone its way. That these houses must be located in areas planned for civic development and that the house itself and every accessory which goes into the house will be selected and installed for service years hence and not just for today's emergency.

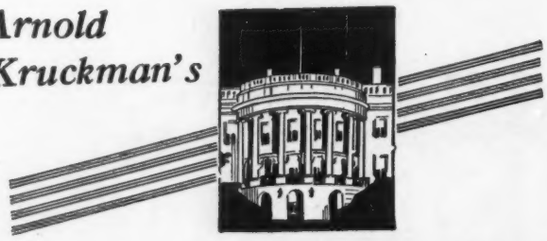
Perhaps the warm air heating industry will have little to say about what happens in each member's community. Perhaps decision will lie with more impressive groups like the realtors, house building contractors, bankers and civic leaders, or even the politicians. But so far as each member of the warm air heating industry can influence such decisions, his recommendations surely should be on the side of well-planned, well-located, well-equipped houses of a selling price range which insures substantial construction.

The warm air heating industry has had plenty of experience to prove the disaster which accompanies any other type of construction. We know that houses poorly and inadequately heated can be rented, sold or filled while a housing shortage exists, but that only an adequately heated house can be rented or sold in a buyers' market. So, in so far as our small voice can be projected, we should advocate the long view and take every opportunity to recommend construction and heating of a quality we know as "best" today.

This is a job for associations and the industry as a whole as well as a job for the individual con-

(*Continued on page 97*)

Arnold Kruckman's



Washington Letter

IF you are foggy in your understanding of the defense housing program, don't worry. So are most of the Federal officials in Washington, and, probably, outside of Washington. What all of them know is that the Government this fiscal year, June 1, 1940, to June 1, 1941, has a grand spending fund of $22,000,000,000 of cash and credit and that another billion dollars will be added to that sum before the fiscal year is up. They also know that over $2,000,000,000 have already been allocated to the defense building program and that more will be added before the year has passed. Most of them know that between $500,000,000 and $1,000,000,000 will be spent on defense housing. What they don't know is who will do the spending and how the spending will be organized. Here is the plan as it stands as of the last week in November.

Who Builds What

The building is to be done at the instance of the Army, the Navy, by the Federal Works Agency, the Public Buildings Administration, the Farm Security Administration, the Defense Homes Corporation, the United States Housing Authority, and is to be financed by Army funds, Navy funds, special funds, Reconstruction Finance Corporation Funds, USHA funds, the President's privy purse, and by the credit of the Federal Housing Administration and the Home Loan Bank Board. By the time this is published other agencies may be introduced in the picture; you never can tell what happens here; but for the sake of general understanding this outline will enable you to get the idea.

Theoretically the whole movement is under the general supervision of C. F. Palmer, head of the housing division of the National Defense Advisory Commission. Mr. Palmer is capable, competent, and patriotic; but he is a business man, who has been introduced into this set-up from the outside; and the regular cog of Government machinery instinctively resents the outsider, which makes operations under outsiders always a little difficult. That may enable you to understand why there are hitches when the hitches occur. The result often is confusing and irritating, but not essentially serious.

How Needs Are Assigned

In theory, when there is a defense housing problem it is first submitted to Mr. Palmer's division. His experts make a preliminary survey, swiftly and realistically and recommend the type of housing that shall be built. If it is exceedingly low-cost, the USHA may be asked to arrange for the construction of one of its projects. If it is low-cost and needed with the utmost speed, the Public Buildings Administration is asked to plan the job and put it in motion. If it is one of those new defense industrial communities carved out of the farmlands, the Farm Security Administration is asked to do the building. If it is a need for a better type of home, a home which it is assumed the higher-paid workers may buy, the newly created Defense Homes Corporation is asked to take charge. And if the industrial community has many workers who may want to build their own, if they can get a loan, the FHA is asked to get on the job.

Army, Navy Buildings

Concurrently, the Army and Navy do some building on their own for their own kind of people, homes that cost from $7,500 to $14,500. These operations, obviously, are few and have little bearing on defense housing. Incidentally, the ubiquitous Secretary of the Interior also messes into the boiling with houses that range from $5,000 to $6,000, with garages, that are built in the vicinity of dams and reclamation projects and similar undertakings which come under Interior. The Secretary tries to give these building projects the flavor of defense work, but the flavor patently is very weak. There may be some other near-defense home building projects in existence or in the offing, but apparently they are negligible so far as this survey is concerned.

The USHA project centers in a local control unit and follows a pattern that is already well known. The Public Buildings project, which probably embraces the majority of defense homes that will be built, is financed by direct appropriation by Congress and is done at the instance of the Army. These defense dwellings are limited by law to a cost of $3,900 per unit and are already in process of building at a cost as low as $2,800. Some other agencies of Government frankly hold they may be necessary in the emergency, but that their economic effect upon the community where they are built will be destructive after the emergency has passed.

These homes are built, usually, around the Camps, Cantonments, and other military communities created by the military defense program. They are rented to families of enlisted men and to the civilian workers engaged in the activities that serve the Camps and so forth. They are also built in shipbuilding communities and in those communities expanded by mushrooming industrial plants, or in communities created by newly located plants.

Two Types of House

As a general thing, the homes follow two types. Those now being built at Ft. Knox, Ky., probably constitute one archtype. They are 4 and 8 family dwellings on a 70-acre area. Each building is separated from the next by 70 feet of lawn. Kitchens are on the street side and the living rooms face towards the back with 50 feet of lawn. Each unit has a kitchen-dinette and living room on the first floor, and 2 or 3 bedrooms on the second. Each building is oriented to the contours of the land to avoid regimentation. There are variations in the patterns of the frame-houses, and in the varicolored walls and roofs to make them individual.

General Construction

Floors are hardwood, plaster walls and ceilings are painted and each home is equipped with steel and cast-iron recess-type 5-foot bathtubs; lavatories, 17 inches by 19 inches; toilet combinations, standard, 12 inches by 14 inches, rough-in; combination sinks and trays; all brass fittings; kitchen ranges; range-boilers, hot-water heaters; refrigerators; screens; medicine cabinets; broom-wall-base cabinets; linoleum on kitchen and bathroom floors; and coal-burning warm-air furnaces square cased. The coal-bins have outside windows for filling.

In areas where oil is the prevailing fuel the furnace will be oil-burning. In other areas gas heating plants will be installed.

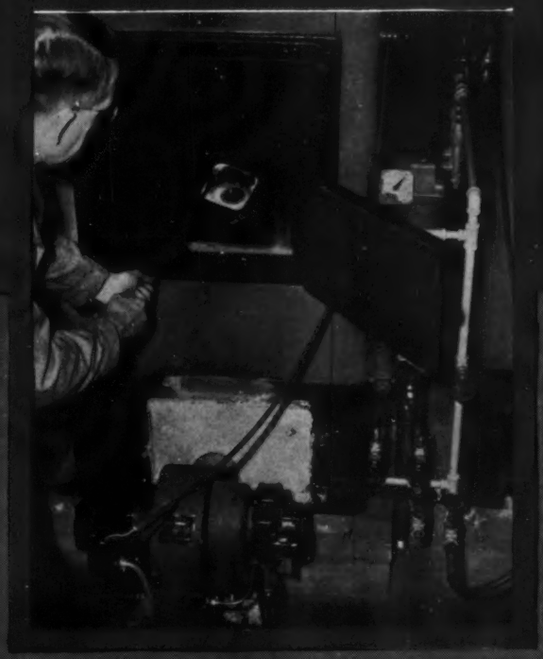
The other defense home type is being built at Ft. Huachuca, Ariz. It is a one-story bungalow with two family units, having either two or three bedrooms, each, a living room, kitchen-dinette, and the bathroom. There is plenty linen and other closet space.

(*Continued on page* 98)

AMERICAN ARTISAN

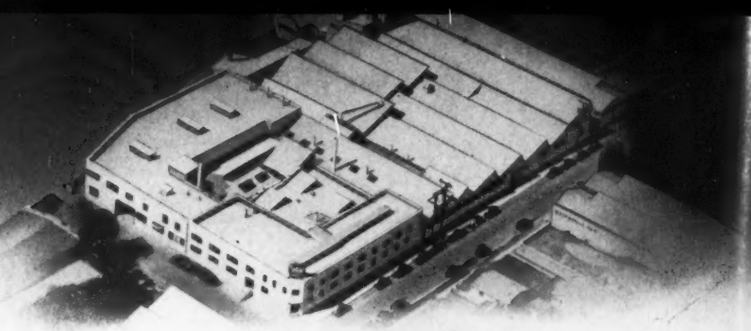
RESIDENTIAL AIR CONDITIONING

SECTION



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Pacific



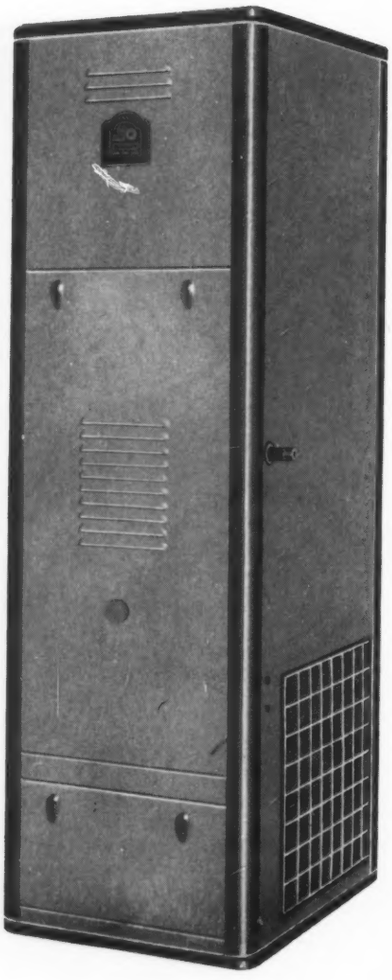
27 SUCCESSFUL YEARS . . . . AND STILL GROWING!

Unusual and Difficult Installation Conditions Are "Duck Soup" for This Flexible Forced-Air Unit!

★ ★ ★

Has Been Successfully Installed On Top Floor of 3 Story House!

★ ★ ★



Available in Six Sizes: 75,000-200,000 B.T.U.

★ ★ ★

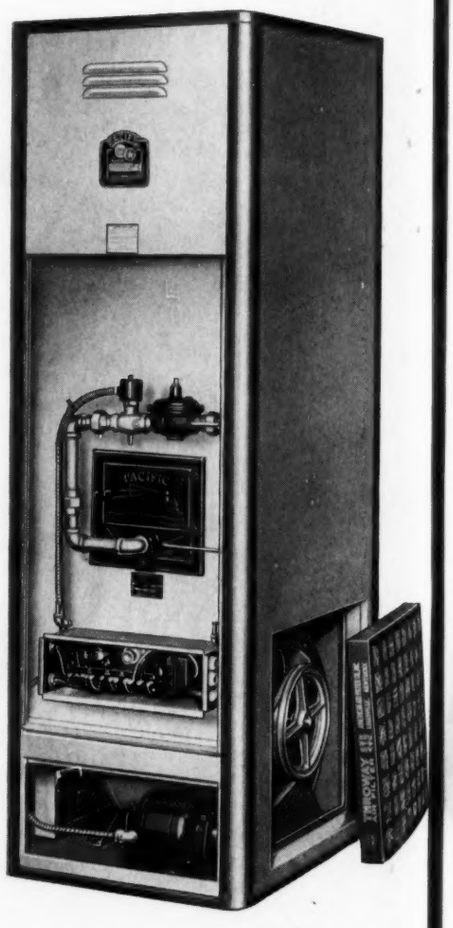
THIS compact gas fired forced-air *"Pacific" Heating and Ventilating Unit* solves many a difficult installation problem. Specially designed for buildings without basements, it is readily placed in a closet, hallway, or on the service porch. It has even been successfully installed on the top floor of a three-story hillside home *(not a recommended practice, of course)* in order to avoid expensive rock excavation and tricky offset floor level duct work. In short, *"Pacific" Model A-11* is adaptable to most every situation.

HEATING ELEMENT . . . Made of best quality extra heavy sheet steel; of round design with vertical baffles that provide exceptional radiation area and, by reducing turbulence and internal resistance, insure maximum air travel. Continuous-weld construction provides a gas-tight unit. Heavy cast-iron firebox liner above burner.

BURNER . . . Improved multi-tubular type of highest efficiency; requires no adjustments.

BLOWER . . . Powerful, quiet centrifugal forward-curved type with Fafnir "lifetime" lubricated steel ball bearings, driven by rated electric motor, and equipped with two-speed V-belt drive which permits adjustments for proper air volume in winter and summer.

WRITE NOW for all the interesting details of this popular forced-air unit, a very profitable model for dealers from coast to coast.

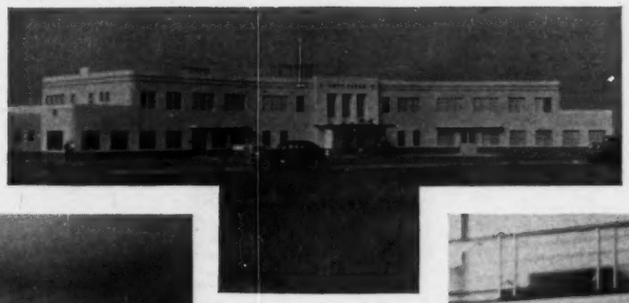


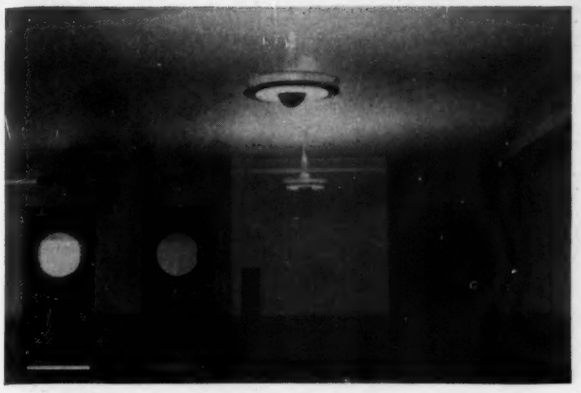
★ ★ ★

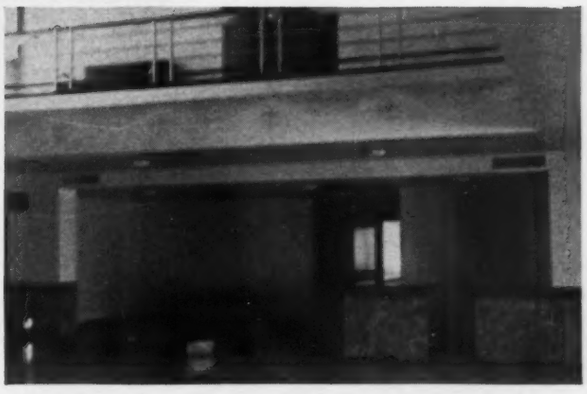
"PACIFIC" offers a *complete* line of gas appliances . . . wall heaters, cabinet heaters, industrial space heaters, water heaters, and both gravity and forced-air furnaces and heating-ventilating units . . . many models and a wide range of capacities, all of ultra modern operating efficiency and durably fine structural quality. BEAT COMPETITION with "PACIFIC". . . the line that has EVERYTHING !

PACIFIC GAS RADIATOR CO.

MAIN OFFICE AND FACTORY HUNTINGTON PARK







Exterior of building. Left — Supplies and returns in coffee shop. Right—Supplies in south end of main lobby.

Cooling, Heating, Ventilating an Airport Administration Building

By L. J. Van Sickle
Engineer, A. A. A. Sheet Metal Works, Inc.

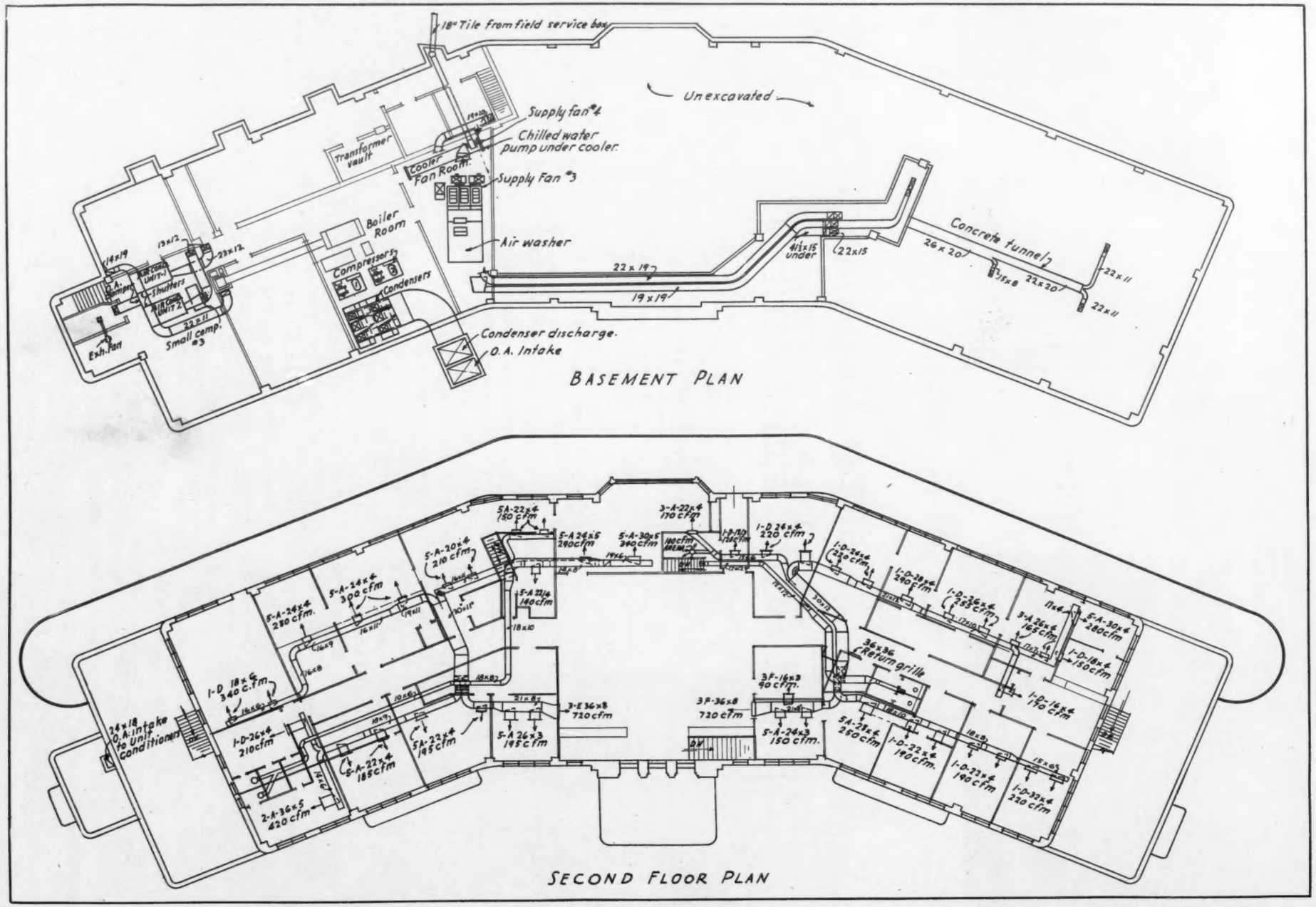
THE recently completed Administration Building and passenger terminal at Love Field, Dallas, Texas' municipal airport, designed by the architectural firm of Flint & Broad, and constructed by Wood and Scurlock, general contractors, is a two-story structure of irregular outline, with exterior dimensions approximately 250 feet by 50 feet, so oriented that the longer walls face East and West. The first floor is taken up by a coffee shop, dining room, passenger lobby, ticket offices, baggage rooms, and offices of Delta Air Lines, while offices of American and Braniff Air Lines, the Civil Aeronautics Authority, W. N. A. A., pilots' and stewardesses' lounging rooms, and the office of the airport manager occupy the second floor. On the roof of the building a penthouse serves as a dispatchers' flight control station.

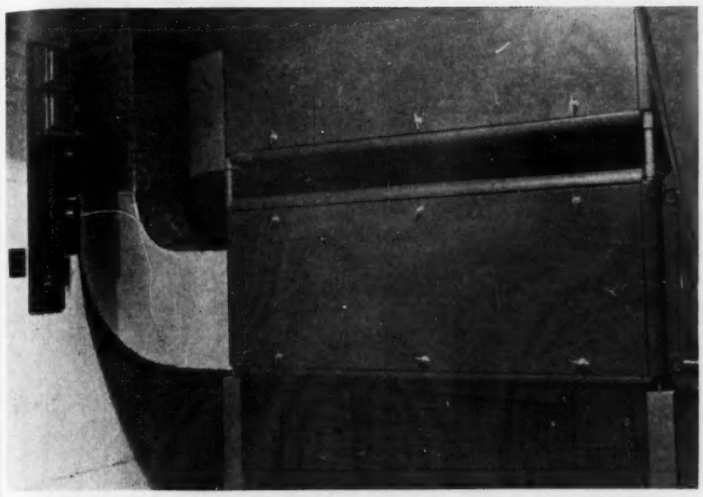
The mechanical engineers for the building construction, Messrs. Zumwalt and Vinther, were required to design an air conditioning system for the entire building, to furnish both heating and cooling, and also to serve planes on the ground, prior to embarcation.

Refrigeration requirements for the building were calculated to be 75 tons, of which 10 tons were allocated to the coffee shop and dining room. The remaining 65 tons were handled through an air washer, the refrigerating plant furnishing 260 gallons of water cooled from 54° F. to 48° F. per minute, for this purpose. The refrigeration plant installed included two compressors—one 50 h.p., and one 40 h.p.—equipped with manual capacity reduction devices—and connected in parallel to an evaporative condenser circulating approximately 20,000 c.f.m., with a shell and tube water cooler with float liquid level control. Both high side oil separator and suction line oil separator are included in the refrigerant line system.

The heating system includes a steel boiler with a capacity of 6080 square feet of direct steam radiation, complete with a vertical gas-burner and automatic electric controls (including motorized valve, pilotstat, low water cutoff and pressuretrol) arranged and connected to maintain boiler pressure at any predetermined point, and to cut the gas off completely on excessive pressure, pilot failure, or low water level. Both standing radiation and convectors are used in various rooms of the building, while the entrances and the lobby on the first floor are heated by fan-coil units.

The air handling equipment for the coffee shop


18" Tile from field service box
Unexcavated
Supply fan #4
Chilled water pump under cooler.
Transformer vault
Cooler Fan Room.
Supply Fan #3
Boiler Room
Air washer
Compressors
Condensers
Concrete tunnel
Condenser discharge.
O.A. Intake
Small comp. #3
Exh. Fan
BASEMENT PLAN
5-A-22x4 150 cfm
3-A-22x4 170 cfm
5-A 24x5 290 cfm
5-A-30x5 340 cfm
1-D 24x4 220 cfm
5-A-20x4 210 cfm
5-A-24x4 280 cfm.
5-A-24x4 300 cfm
5-A 22x4 140 cfm
1-D 18x4 340 C.fm
24x18 O.A. intake to unit conditioner
1-D-26x4 210 cfm
2-A-36x5 420 cfm
5-A-22x4 185 cfm
5-A-22x4 195 cfm
3-E 36x8 720 cfm
5-A 26x3 195 cfm
3F-36x8 720 cfm
3F-16x3 90 cfm.
5-A-24x3 150 cfm.
36x36 Return grille
1-D-24x4 250 cfm
1-D-28x4 240 cfm
1-D-26x4 265 cfm
3-A 26x4 165 cfm
5-A-30x4 280 cfm
1-D-18x4 150 cfm
1-D-16x4 150 cfm
5-A-28x4 250 cfm
1-D-22x4 190 cfm
1-D-32x4 220 cfm
SECOND FLOOR PLAN



Left—Unit air conditioner for coffee shop and dining room. Contains cooling coils, heating coils, blower, motor, by-pass dampers.

◆

and dining room consists of two unit assembly air conditioners (see plans) with direct expansion cooling coils, steam heating coils, blowers, motors, and drives, with face and bypass dampers regulated by duct type thermostats for control of temperatures within the conditioned areas. Air delivery to the two spaces is through side-wall outlets, from furred ducts.

Cooling, Heating Zones

For the remainder of the building, air distribution is handled by three zone fans, with zones as follows:

Zone 1. All first floor not occupied by coffee shop or dining room.

Zone 2. East rooms of second floor.

Zone 3. West rooms of second floor.

Ordinarily, rooms on the west side of the first floor of a Dallas building would be a zone separate from the rooms on the east side, but in this building a second story "promenade deck" on the west side of the building provides ample shade for the west windows.

How Air Is Cooled

Air conditioning is taken care of by a double bank air washer, which discharges into a bank of three plenum chambers, each of which serves a separate zone fan. In each plenum, moreover, a steam heating coil tempers the air during winter operation of the system. Control of zone air temperature is accomplished by means of face and bypass dampers, with separate sets for each zone. The washer room serves as a suction plenum, to which all return air travels, either through a concrete duct tunnel, or through vertical return air shafts, directly to the space above the washer. Outdoor air, both for the conditioning system and for the evaporative condenser passes into the building through the lower half of the concrete air shaft shown on the plan, thence through a vertical bank of 4-inch filters into the ventilation air plenum. Two sets of control dampers admit this air into the washer room. The first set of dampers for minimum ventilation air control admit the air through a set of tempering coils; the second set of dampers can be opened, when outdoor temperatures permit, to furnish a high percentage of the total air circulation from the ventilation air supply.

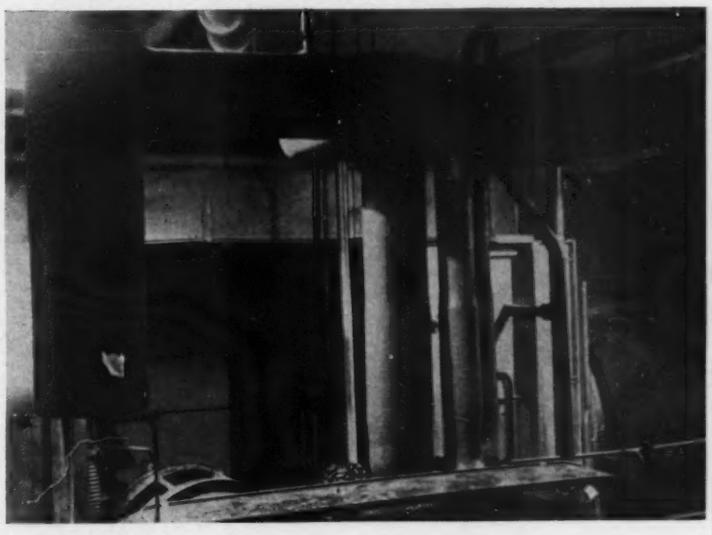
The evaporative condenser air supply passes through the same set of filters, thence through the sprays and coils, to the blower, which discharges the air, through the large ducts shown in a detail, to the upper half of the concrete air tunnel and out of the building.

Sheet Metal Construction

All ductwork is constructed of copper bearing galvanized steel sheets, of the following gauges:

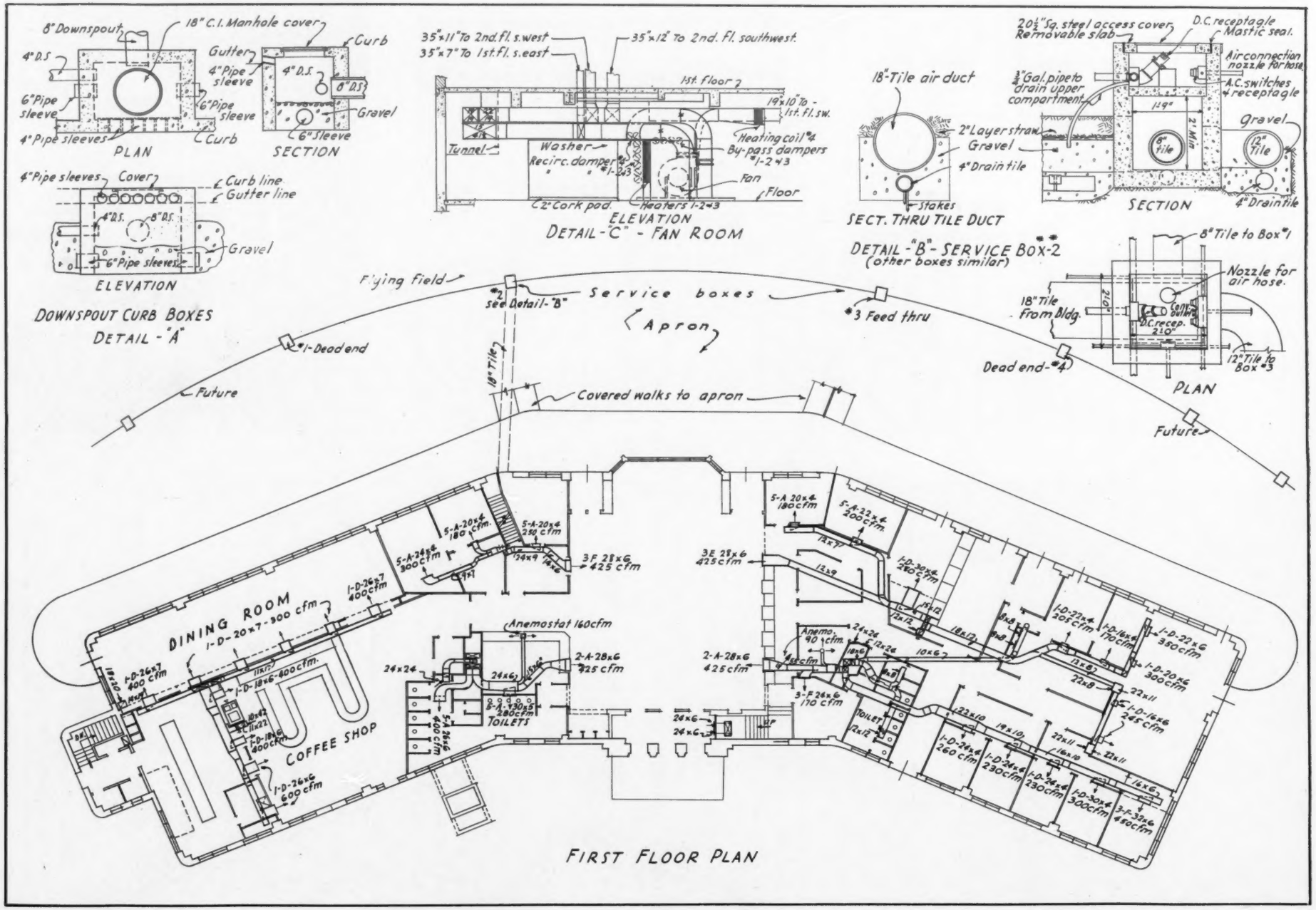
Largest dimensions of duct	Gauge
Up to 12"	No. 26
13" to 30"	No. 24
31" to 60"	No. 22
61" and up	No. 20

Casings and plenum chambers are constructed of 18-gauge sheets braced with 1¼-inch angle irons. Uninsulated ducts are cross-broken. Vertical ducts are supported from each floor slab by 2-inch angle irons and horizontal ducts have



◆

Right—Refrigeration equipment showing a compressor, evaporative condenser and section of the outdoor air intake duct.


8" Downspout
18" C.I. Manhole cover
Curb
Gutter
4" D.S.
4" Pipe sleeve
6" Pipe sleeve
4" Pipe sleeves
Curb
PLAN
8" D.S.
Gravel
6" Sleeve
SECTION
4" Pipe sleeves
Cover
Curb line
Gutter line
4" D.S.
8" D.S.
Gravel
6" Pipe sleeves
ELEVATION
DOWNSPOUT CURB BOXES
DETAIL - "A"
35"x11" To 2nd. fl. s.west
35"x7" To 1st. fl. s.east
35"x12" to 2nd. Fl. southwest.
1st. Floor
19"x10" To - 1st. fl. sw.
Tunnel
Washer
Recirc. damper #1-2+3
Heating coil #4
By-pass dampers #1-2+3
Fan
Floor
2" Cork pad.
Heaters 1-2+3
ELEVATION
DETAIL - "C" - FAN ROOM
18" Tile air duct
2" Layer straw
Gravel
4" Drain tile
Stakes
SECT. THRU TILE DUCT
20½" Sq. steel access cover
Removable slab
D.C. receptacle
Mastic seal.
¾" Gal. pipe to drain upper compartment
Air connection nozzle for hose
A.C. switches & receptacle
12"9"
2' Min.
9" Tile
12" Tile
Gravel
4" Drain tile
SECTION
DETAIL - "B" - SERVICE BOX #2
(other boxes similar)
8" Tile to Box #1
Nozzle for air hose.
18" Tile from Bldg.
2'-0"
Conc. collar
D.C. recep. 210
12" Tile to Box #3
Dead end - #4
PLAN
Flying Field
#2 see Detail - "B"
Service boxes
Apron
#3 Feed thru
#1 - Dead end
Future
18" Tile
Covered walks to apron
Future
DINING ROOM
1-D-20x7 - 300 cfm
1-D-26x7 400 cfm
1-D-18x6 - 400 cfm.
1-D-26x7 400 cfm
1-D-18x6 400 cfm
1-D-26x6 600 cfm
COFFEE SHOP
5-A-20x4 180 cfm.
5-A-20x4 250 cfm
5-A-24x4 300 cfm
3F 28x6 425 cfm
Anemostat 160cfm
2-A-28x6 425 cfm
5-A 26x6 400 cfm
2-A-30x5 280cfm
TOILETS
3E 28x6 425 cfm
5-A 20x4 180 cfm
5-A-32x4 200 cfm
1-D-30x4 280 cfm
Anemo. 90 cfm
2-A-28x6 425 cfm
3-F 26x6 170 cfm
TOILETS
1-D-27x4 205 cfm
1-D-16x4 170 cfm
1-D-22x6 350 cfm
1-D-20x6 300 cfm
1-D-16x6 245 cfm
1-D-24x4 260 cfm
1-D-24x4 230 cfm
1-D-24x4 230 cfm
1-D-30x4 300 cfm
3-F-32x6 450 cfm
FIRST FLOOR PLAN

hangers spaced not more than 12 feet apart.

All square duct elbows are equipped with elbow vanes. Splitter dampers are provided at each branch-off and at each sweeping elbow takeoff, of No. 12 gauge metal; each splitter damper equipped with a regulator.

Most air outlets are supplied from square taps, directly into the ducts. (See plans.) With this type of takeoff, a shop-made "Santrol" was installed, to insure an even distribution of air over the grille surface. The "Santrols" as installed were made up of some five curved blades, pivoted at one end in a frame, so constructed that each blade could be moved independently of the others.

Control Operation

Winter temperature regulation on the three zone fans and on the two unit conditioners is obtained in part through the operation of face and bypass dampers and in part through the operation of modulating steam valves. The cycle of operation on each zone is such that on a rising temperature the recirculated air damper gradually closes and the bypass damper (outside air) gradually opens; when the dampers have moved through 50% of their maximum travel, the steam valve will begin to close; as the temperature continues to rise, the recirculated air damper will completely close, the bypass damper will completely open, and the steam valve will completely close. On a falling temperature, the operations will be reversed.

For summer operation, the recirculated air damper will gradually open on a rising temperature; the bypass damper gradually closing; on a falling temperature this process will be reversed.

Control of humidity, winter or summer, is manual. The water circulating pump is provided with a starter having an "off-hand-automatic" control switch. In the "automatic" position, the pump is under the control of a protective thermostat; in the "hand" position, the pump can be operated to furnish winter humidification. Control of the refrigeration system is entirely manual; the operator, if he chooses, can carry water temperatures ranging from 48°-54° as designed to 42°-48° and by this means, vary the relative humidity of the spaces furnished from the air washer.

Three Ventilating Systems

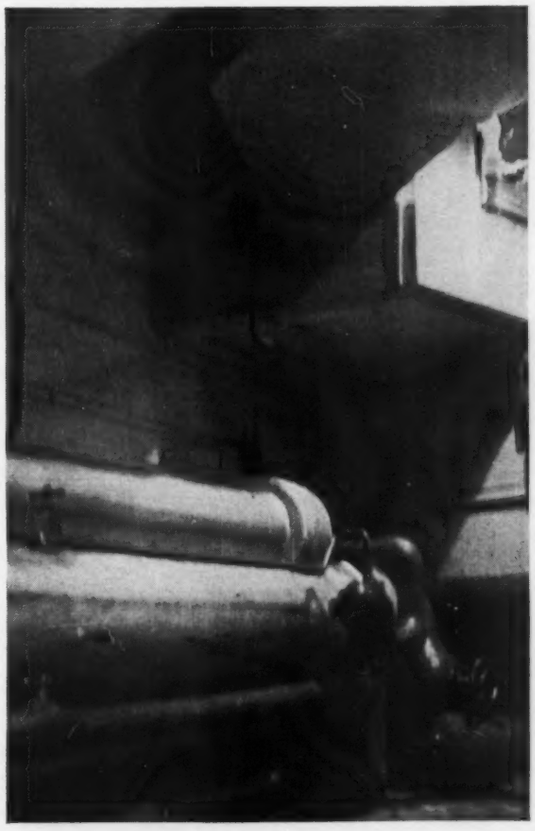
Three exhaust ventilating systems are installed in the building. The first of these exhausts air from the toilets throughout the building, and is powered by an exhaust fan located in the attic space beneath the control tower, discharging to the outside of the building through the roof.

The second system is special and includes a direct connected fan and ductwork to take care of exhaust fumes from an engine driven emergency generating electric plant in the basement.

The kitchen fume exhaust fan was installed in connection with the range hood, which was furnished as a part of the mechanical contract. The hood was constructed of No. 18-gauge black steel sheets, braced with angle iron, and was provided with a lighting gutter as well as a grease gutter.

A. C. Service for Planes

A feature of the air conditioning system which at the present writing is unique in ventilation practice is the method by which planes are furnished conditioned air while standing on the runway apron during loading and unloading of passengers. Four field service boxes were installed on the apron by the General Contractor. Details of their construction are given in a detail. The air handling facilities in connection with the service boxes include a brass nozzle with a tight fitting damper and connection to a fan in the basement through vitrified salt-glazed sewer pipe. The air tile is laid in a bed of gravel, and joints are caulked with oakum and asphaltic mastic.



Water cooler (lower foreground) and, behind, enclosure for the mill supply fan which serves the field boxes at which planes are cooled or heated. Fan has 2,400 cfm capacity at 7½-inch resistance.

Inside the building the tile duct is joined to a galvanized steel duct from a special fan in the washer room. This fan is a mill supply type

(*Continued on page* 106)

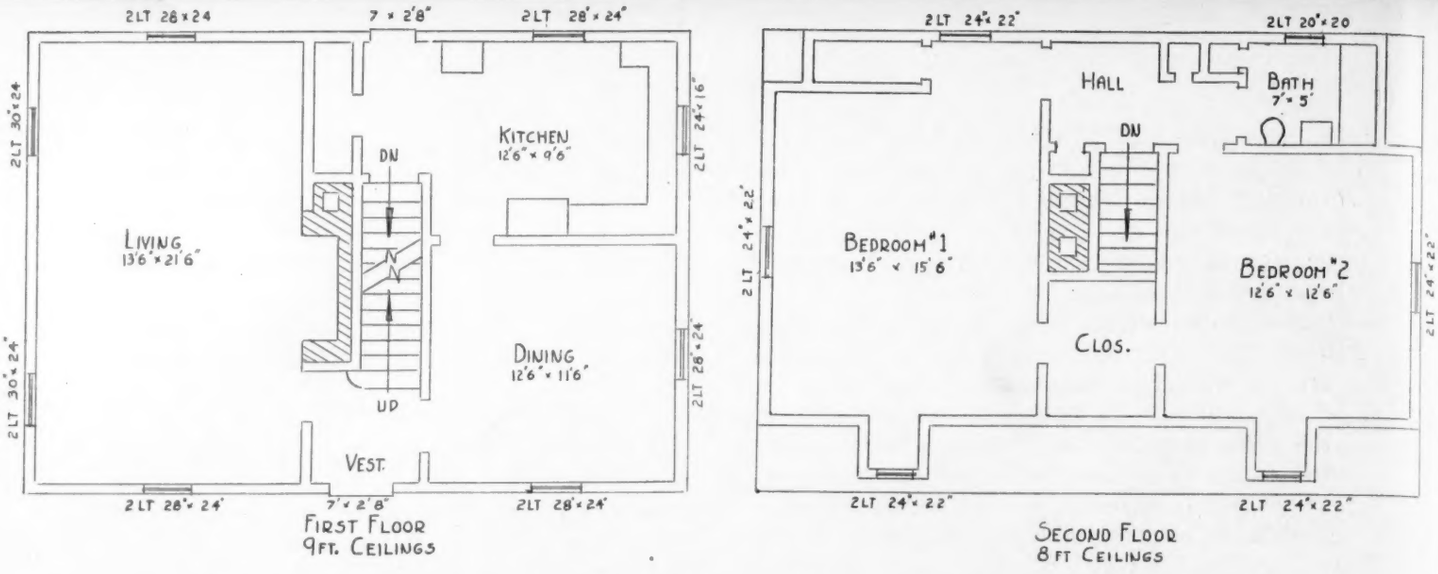


Fig. 1—Floor plans of a typical installation for which engineering data will be calculated and entered from the precalculated tables and charts. Below—Fig. 2—This form of Data Sheet wil be used. Entries will be made progressively as the discussions appear. See text for explanation of entries.

Technical Code—*Precalculated* [Part 2]

By Henry Aronson

Field Engineer, Premier Furnace Co.

BEFORE the heat losses for a building may be calculated, it is necessary to obtain the physical data pertaining to the building, such as cubics, exposed area, glass area, etc. This article concerns itself with a method of obtaining that information. This part of the proceedure ordinarily takes a great deal of time and effort which the use of the charts and tables cuts down considerably.

To anyone who has ever used charts, the ones presented here should be quite clear, as they are of a standard form. Most of the charts have vertical indicating scales on either or both sides, and horizontal scales at the top. These scales show dimensions. The various scales are identified, and where more than one scale appears on the same chart, it is important that the proper scales be used. For example, when reading crackage for double hung windows, be sure that both the height and width scales are for double hung windows.

The easiest way to read from these charts is to use a transparent straightedge, such as a triangle, as a guide. All the charts are provided

HEATING CONTR. Allweather Conditioning Co OWNER L. M. Hurdon DATE 11-15-40
ADDRESS ADDRESS 712 Powhatan Dr.
CITY Chicago, Ill CITY Edgebrook, Ill
EQUIPMENT FUEL Coal TEMP. DIFF. REGISTER LOC. DESIGN TEMP. BONNET TEMP.

Room / Dimensions	Cubical Cont.	Crackage	Exp Wall	Glass	Net Wall	Exp Floor	Exp Ceil.		B.T.U. Per Deg. T.D.	Equiv. Length	Reg. Temp. C.F.M.	Rnd. Pipe Corr.	Rect. Duct	Vol. Reg.	Equiv. Length	Rnd. Pipe Corr.	Rect. Duct	Vol. Reg.
Living 21½×13½×9	2673	39	44 441	48	393	297	42											
Kitchen 13½×9½×9	1069	40	34 225	38	187	119												
Dining 12½×11½×9	1294	19	34 216	24	192	144	96											
Vestibule 5½×5½×9	272	21	35 60	19	31	30	18											
Bedroom #1 13½×13½×8	1738	26	34-169 35-184	27	150		216	175										
Bath 7×5×8	280	13	7-56 5-40	7	49		35	40										
Bedroom #2 12½×12½×8	1250	18	12½-100 11-136	18	91		156	127										
Hall 5½×5×8	220		35 44		44		28											

CUBICAL CONTENTS, ROOMS WITH 9 FT. CEILINGS

	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15	16	17	18	19	20
5	225																									
5½	248	272																								
6	270	297	324																							
6½	293	322	351	380																						
7	315	346	378	410	441																					
7½	338	371	405	439	473	506																				
8	360	395	432	468	504	540	576																			
8½	383	421	459	497	536	574	612	650																		
9	405	445	486	527	567	608	648	689	729																	
9½	428	470	513	556	599	641	684	727	770	812																
10	450	495	540	585	630	675	720	765	810	855	900															
10½	473	520	567	614	662	709	756	803	851	898	945	992														
11	495	544	594	644	693	743	792	842	891	941	990	1040	1089													
11½	518	569	621	673	725	776	828	880	932	983	1035	1087	1139	1190												
12	540	594	648	702	756	810	864	918	972	1026	1080	1134	1188	1242	1296											
12½	563	619	675	731	788	844	900	956	1013	1069	1125	1181	1238	1294	1350	1406										
13	585	643	702	761	819	878	936	995	1053	1112	1170	1229	1287	1346	1404	1463	1521									
13½	608	668	729	790	851	911	972	1033	1094	1154	1215	1276	1337	1397	1458	1519	1580	1640								
14	630	693	756	819	882	945	1008	1071	1134	1197	1260	1323	1386	1449	1512	1575	1638	1701	1764							
14½	653	718	783	848	914	979	1044	1109	1175	1240	1305	1370	1436	1501	1566	1631	1697	1762	1827	1892						
15	675	742	810	878	945	1013	1080	1148	1215	1283	1350	1418	1485	1553	1620	1688	1755	1823	1890	1958	2025					
16	720	792	864	936	1008	1080	1152	1224	1296	1368	1440	1512	1584	1656	1728	1800	1872	1944	2016	2088	2160	2304				
17	765	841	918	995	1071	1148	1224	1301	1377	1454	1530	1607	1683	1760	1836	1913	1989	2066	2142	2219	2295	2448	2601			
18	810	891	972	1053	1134	1215	1296	1377	1458	1539	1620	1701	1782	1863	1944	2025	2106	2187	2268	2349	2430	2592	2754	2916		
19	855	940	1026	1112	1197	1283	1368	1454	1539	1625	1710	1796	1881	1967	2052	2138	2223	2309	2394	2480	2565	2736	2907	3078	3249	
20	900	990	1080	1170	1260	1350	1440	1530	1620	1710	1800	1890	1980	2070	2160	2250	2340	2430	2520	2610	2700	2880	3060	3240	3420	3600
21	945	1039	1134	1229	1323	1418	1512	1607	1701	1796	1890	1985	2079	2174	2268	2363	2457	2552	2646	2741	2835	3024	3213	3402	3591	3780
22	990	1089	1188	1287	1386	1485	1584	1683	1782	1881	1980	2079	2178	2277	2376	2475	2574	2673	2772	2871	2970	3168	3366	3564	3762	3960
23	1035	1138	1242	1346	1449	1553	1656	1760	1863	1967	2070	2174	2277	2381	2484	2588	2691	2795	2898	3002	3105	3312	3519	3726	3933	4140
24	1080	1188	1296	1404	1512	1620	1728	1836	1944	2052	2160	2268	2376	2484	2592	2700	2808	2916	3024	3132	3240	3456	3672	3888	4104	4320
25	1125	1237	1350	1463	1575	1688	1800	1913	2025	2138	2250	2363	2475	2588	2700	2813	2925	3038	3150	3263	3375	3600	3825	4050	4275	4500
26	1170	1287	1404	1521	1638	1755	1872	1989	2106	2323	2340	2457	2574	2691	2808	2925	3042	3159	3276	3393	3510	3744	3978	4212	4446	4680
27	1215	1336	1458	1580	1701	1823	1944	2066	2187	2309	2430	2552	2673	2795	2916	3038	3159	3281	3402	3524	3645	3888	4131	4374	4617	4860
28	1260	1386	1512	1638	1764	1890	2016	2142	2268	2394	2520	2646	2772	2898	3024	3150	3276	3402	3528	3654	3780	4032	4284	4536	4788	5040
29	1305	1435	1566	1697	1821	1958	2088	2219	2349	2480	2610	2741	2871	3002	3132	3263	3393	3524	3654	3785	3915	4176	4437	4698	4959	5220
30	1350	1485	1620	1755	1890	2025	2160	2295	2430	2565	2700	2835	2970	3105	3240	3375	3510	3645	3780	3915	4050	4320	4590	4860	5130	5400

Fig. 3—Precalculated table of cubical contents. Length and width are read on the horizontal and vertical scales. Use this table for 9-foot ceiling height. Table for 8-foot ceilings is on page 43.

with sufficient guide lines to follow. In some cases the exact dimension within an inch or two may not appear. In this event use the closest dimension that is shown. Should the result appear as a fraction, other than one-half, use the nearest whole number. Fractions are confusing and on any job, the minor losses and gains will even up. All through this series, every effort will be made to avoid hair-splitting.

To best demonstrate and explain the use of the tables and charts, a house plan (Fig. 1) has been selected and a suitable data sheet (Fig. 2) will be filled in as the explanation progresses. The writer will describe a proceedure that has been most practical for him. However, the reader may find it desirable to vary somewhat from this to conform with some method more familiar to him. As stated previously, these articles are intended for use by heating men familiar with usual practices.

The first step is to fill in the heading of the sheet. The writer believes this to be a necessary first step, particularly where several plans are under consideration at the same time. It also will avoid confusion later on, when it is time to file the data sheet. A hand-fired coal job is being figured for this particular plan. The fuel used has no effect on the method of figuring losses and air delivery except in exceptional cases.

After examining the plan, the left-hand column may be filled in with the names of the rooms and their dimensions. The writer's method is to take a vertical column at a time, so that all calculations of one type can be made consecutively. This way it is possible to get all the desired information from one chart with one reference to it. After the room names have been written in, the cubical contents can be filled in. Starting with the first floor, refer to the cubics chart for rooms with 9-foot ceilings (Fig. 3, page 39). For the living room, read across the 22-foot line (the closest to 21½-foot) to the 13½-foot column. This shows cubical contents of 2673 which is entered in the cubics column opposite the living room. The same is done for the other rooms on the first floor. The second floor rooms are read from the table for rooms with 8-foot ceilings (Fig. 4, page 43).

The next column is for crackage. There has been considerable argument concerning the relative merits of the cubics method vs. the crackage method of figuring infiltration losses. In a house such as the one shown here, there would be little difference. However, where there is an unusual ratio between glass area and wall area, the crackage method is far more accurate. The framers of the Technical Code and the ASH&VE prefer the crackage method and it is being generally accepted.

The crackage chart (Fig. 5, page 40) is in a little different form than the cubics tables, but the method of use is basically the same. In figuring crackage, only the side of the room having the greatest amount of crackage is considered, provided that in no case less than one-half the

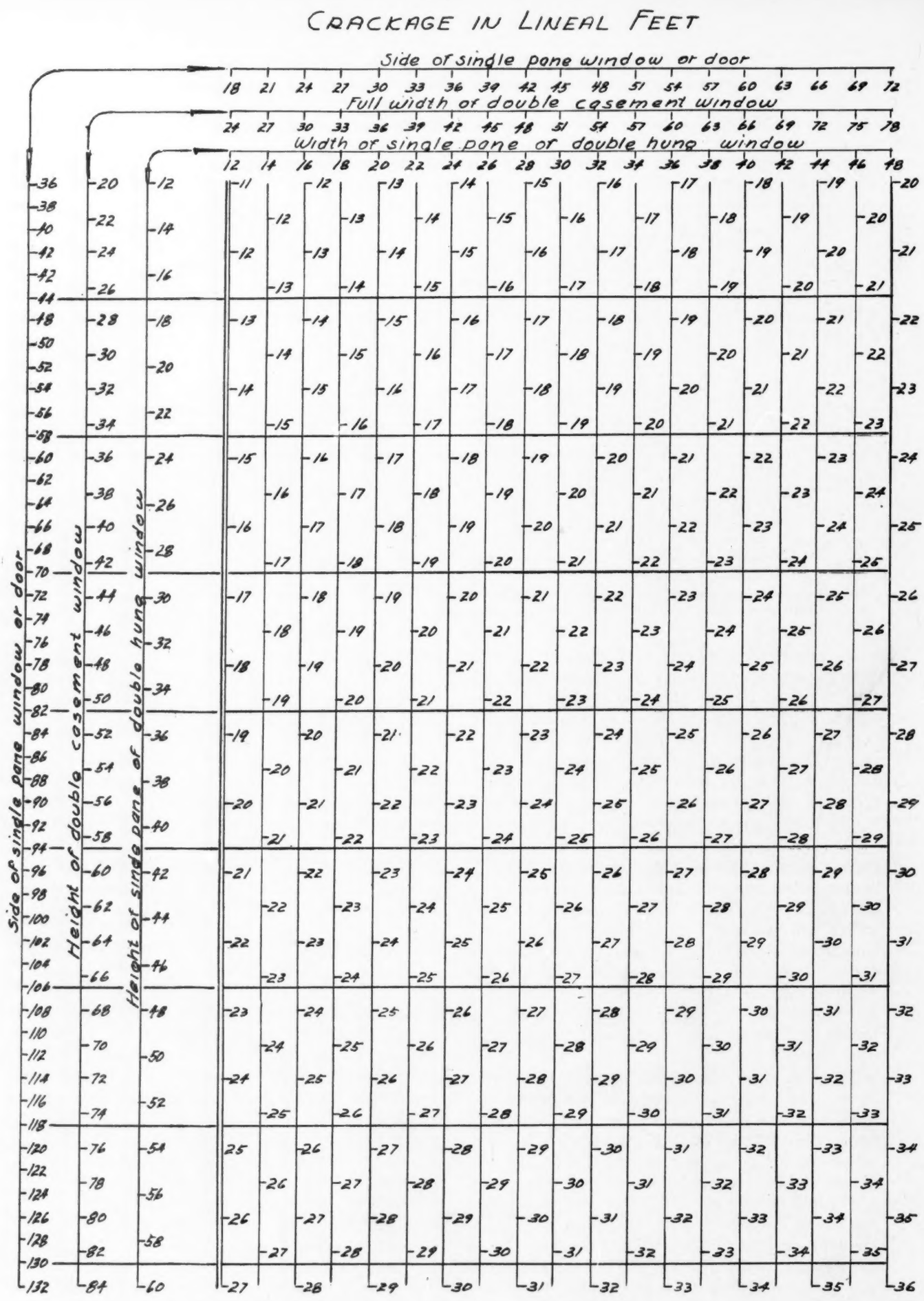

CRACKAGE IN LINEAL FEET
Side of single pane window or door
18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72
Full width of double casement window
24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78
Width of single pane of double hung window
12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Side of single pane window or door
Height of double casement window
Height of single pane of double hung window

Fig. 5—Crackage Chart for infiltration. Three scales are used as explained in the text. In using be sure that the proper pair of scales (one vertical; one horizontal) are selected. Read only to the nearest half foot.

AREAS OF WALLS, FLOORS & CEILINGS

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
5	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275
5½	165	171	176	182	187	193	198	204	209	215	220	225	231	237	242	248	253	259	264	270	275	281	286	292	297	303
6	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330
6½	195	202	208	215	221	228	234	241	247	254	260	267	273	280	286	293	299	306	312	319	325	332	338	345	351	358
7	210	217	224	231	238	245	252	259	266	273	280	287	294	301	308	315	322	329	336	343	350	357	364	371	378	385
7½	225	233	240	248	255	263	270	278	285	293	300	308	315	323	330	338	345	353	360	368	375	383	390	398	405	413
8	240	248	256	264	272	280	288	296	304	312	320	328	336	344	352	360	368	376	384	392	400	408	416	424	432	440
8½	255	264	272	281	289	298	306	315	323	332	340	349	358	366	374	383	391	400	408	417	425	434	442	451	459	468
9	270	279	288	297	306	315	324	333	342	351	360	369	378	387	396	405	414	423	432	441	450	459	468	477	486	495
9½	285	295	304	314	323	333	342	352	361	371	380	390	399	409	418	428	437	447	456	466	475	485	494	504	513	523
10	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550
10½	315	326	336	347	357	368	378	389	399	410	420	431	441	452	463	473	483	494	504	515	525	536	546	557	567	578
11	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528	539	550	561	572	583	594	605
11½	345	357	368	380	391	403	414	426	437	449	460	472	483	495	506	518	529	541	552	564	575	587	598	610	621	633
12	360	372	384	396	408	420	432	444	456	468	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660
12½	375	388	400	413	425	438	450	463	475	488	500	513	525	538	550	563	575	588	600	613	625	638	650	663	675	688
13	390	403	416	429	442	455	468	481	494	507	520	533	546	559	572	585	598	611	624	637	650	663	676	689	702	715
13½	405	419	432	446	459	473	486	500	513	527	540	554	567	581	594	608	621	635	648	662	675	689	702	716	729	743
14	420	434	448	462	476	490	504	518	532	546	560	574	588	602	616	630	644	658	672	686	700	714	728	742	756	770
14½	435	450	464	479	493	508	522	537	551	566	580	595	609	624	638	653	667	682	696	711	725	740	754	769	783	798
15	450	465	480	495	510	525	540	555	570	585	600	615	630	645	660	675	690	705	720	735	750	765	780	795	810	825
16	480	496	512	528	544	560	576	592	608	624	640	656	672	688	704	720	736	752	768	784	800	816	832	848	864	880
17	510	527	544	561	578	595	612	629	646	663	680	697	714	731	748	765	782	799	816	833	850	867	884	901	918	935
18	540	558	576	594	612	630	648	666	684	702	720	738	756	774	792	810	828	846	864	882	900	918	936	954	972	990
19	570	589	608	627	646	665	684	703	722	741	760	779	798	817	836	855	874	893	912	931	950	969	988	1007	1026	1045
20	600	620	640	660	680	700	720	740	760	780	800	820	840	860	880	900	920	940	960	980	1000	1020	1040	1060	1080	1100
21	630	651	672	693	714	735	756	777	798	819	840	861	882	903	924	945	966	987	1008	1029	1050	1071	1092	1113	1134	1155
22	660	682	704	726	748	770	792	814	836	858	880	902	924	946	968	990	1012	1034	1056	1078	1100	1122	1144	1166	1188	1210
23	690	713	736	759	782	805	828	851	874	897	920	943	966	989	1012	1035	1058	1081	1104	1127	1150	1173	1196	1219	1242	1265
24	720	744	768	792	816	840	864	888	912	936	960	984	1008	1032	1056	1080	1104	1128	1152	1176	1200	1224	1248	1272	1296	1320
25	750	775	800	825	850	875	900	925	950	975	1000	1025	1050	1075	1100	1125	1150	1175	1200	1225	1250	1275	1300	1325	1350	1375
26	780	806	832	858	884	910	936	962	988	1014	1040	1066	1092	1118	1144	1170	1196	1222	1248	1274	1300	1326	1352	1378	1404	1430
27	810	837	864	891	918	945	972	999	1026	1053	1080	1107	1134	1161	1188	1215	1242	1269	1296	1323	1350	1377	1404	1431	1458	1485
28	840	868	896	924	952	980	1008	1036	1064	1092	1120	1148	1176	1204	1232	1260	1288	1316	1344	1372	1400	1428	1456	1484	1512	1540
29	870	899	928	957	986	1015	1044	1073	1102	1131	1160	1189	1218	1247	1276	1305	1334	1363	1392	1421	1450	1479	1508	1537	1566	1595
30	900	930	960	990	1020	1050	1080	1110	1140	1170	1200	1230	1260	1290	1320	1350	1380	1410	1440	1470	1500	1530	1560	1590	1620	1650

Fig. 7—Area table for walls, floors, ceilings. There are two of these tables; Table 6 is on page 43. To use, select ceiling height on vertical scale and wall length on horizontal scale. The intersection gives square feet of area.

total crackage of the room is figured.

The windows shown on the plan are double hung, so the inside scales on the chart are used. In the living room, which has four windows, the two larger ones are on one wall, so it is obvious that only these need be considered. These windows have panes 30 inches wide and 24 inches high. To obtain the crackage, line up the straightedge with the 24-inch indicator on the vertical scale for double hung windows, and take the result in footage from the point where the straightedge intersects the 30-inch width lines (indicated on the horizontal scale above). This point shows 19½ feet of crack. There are two windows of this size making a total of 39 feet of crackage for this room. Follow the same proceedure for all other rooms.

The crackage must be figured on outside doors also. The two doors shown on the plan are 7 feet by 2 feet 8inches, or 84 inches by 32 inches. To obtain the crackage for a door use the outside scales. A door 84 inches by 32 inches has slightly over 21 feet of crack, which would be considered 21 even. The crackage chart includes an allowance for sash and frame, as this must be included.

The middle scales are for double, vertical casement windows, or French doors. There are so many special types of casement windows, it would be impossible to chart them concisely, so only those most generally used have been charted.

The next column is for exposed wall area. The writer usually scales off the running feet of exposed wall and notes it in the corner of the space in small figures as shown on the data sheet. This way it is possible to fill in the entire column with a single reference to the tables. The second floor has two different types of exposures: outside walls, and walls next to attic space. As the heat loss coefficients will be different for these two exposures it is necessary to keep them separated. The writer's method is shown on the data sheet. Someone else might prefer to use separate lines. The area tables (Fig. 6, page 43 and Fig. 7, page 41) are read the same as the cubics tables and are self-explanatory. For the first floor all the answers will be in one of the 9-foot columns, and the second floor in the 8-foot column. The living room has a wall length of 49 feet with a ceiling height of 9 feet. The table (Fig. 7) shows this to total 441 square feet of area. The other rooms are treated the same way and the column completed.

Glass area is placed in the next column as shown. Glass areas have been plotted in a chart (Fig. 8, page 42) similar to the crackage chart. There are two horizontal scales and two vertical scales, but one vertical scale is placed on each side of the chart for easy reading: one for double-hung; and one for single-pane windows, casements, and doors. Double-hung windows are dimensioned by the pane size and the other types by the opening size. Doors, of course, are figured as windows in heat loss calculations. An allowance for sash has been included in the chart for

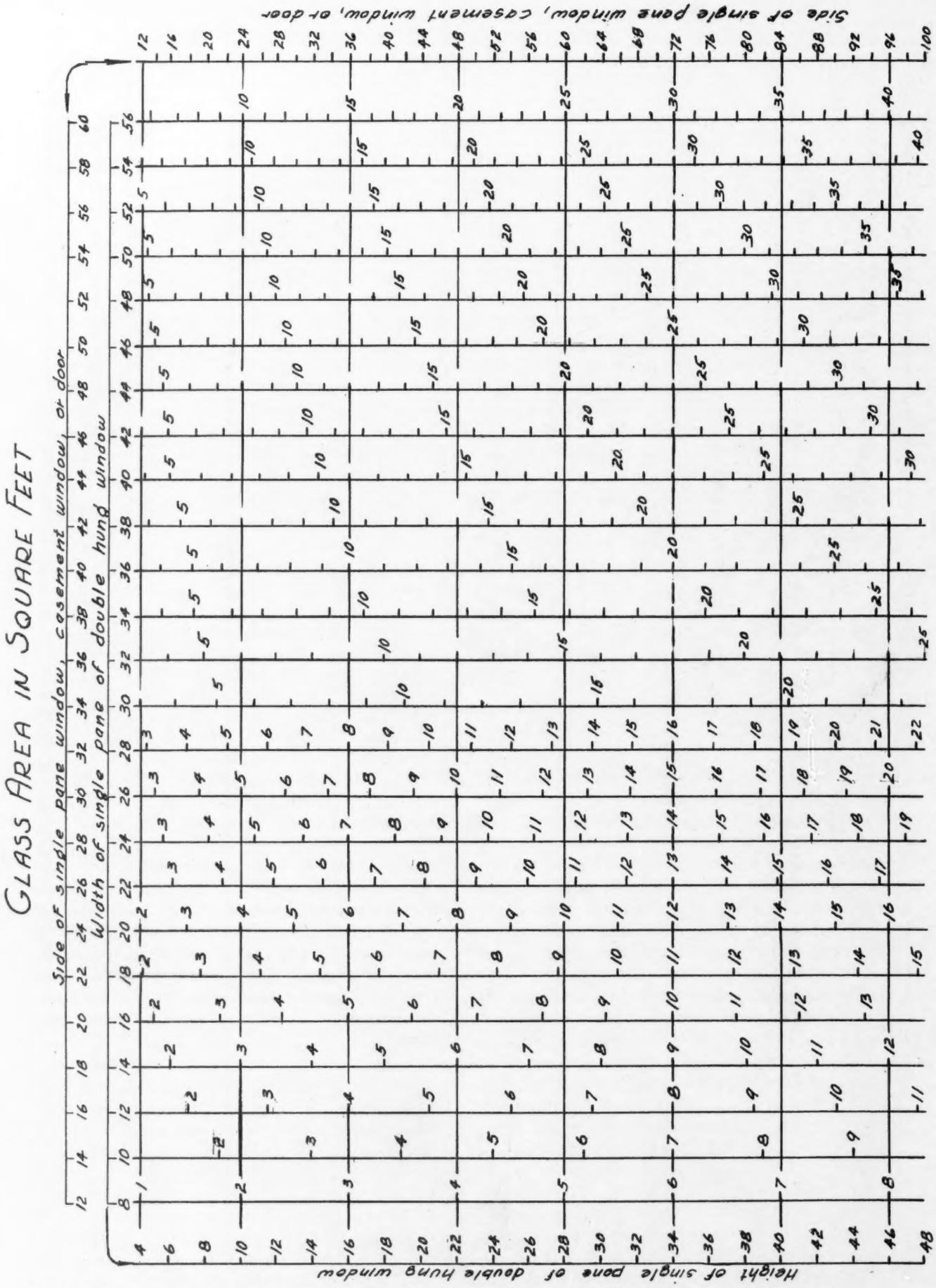

GLASS AREA IN SQUARE FEET
Side of single pane window, casement window, or door
Width of single pane of double hung window
Side of single pane window, casement window, or door
Height of single pane of double hung window

Fig. 8—Glass area chart for double-hung windows, casement windows; also doors. Note double-hung pane height on left, vertical scale and side of single pane casement or door on right, vertical scale.

CUBICAL CONTENTS, ROOMS WITH 8FT CEILINGS

	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15	16	17	18	19	20
5	200																									
5½	220	242																								
6	240	264	288																							
6½	260	286	312	338																						
7	280	308	336	364	392																					
7½	300	330	360	390	420	450																				
8	320	352	384	416	448	480	512																			
8½	340	374	408	442	476	510	544	578																		
9	360	396	432	468	504	540	576	612	648																	
9½	380	418	456	494	532	570	608	646	684	722																
10	400	440	480	520	560	600	640	680	720	760	800															
10½	420	462	504	546	588	630	672	714	756	798	840	882														
11	440	484	528	572	616	660	704	748	792	836	880	924	968													
11½	460	506	552	598	644	690	736	782	828	874	920	966	1012	1058												
12	480	528	576	624	672	720	768	816	864	912	960	1008	1056	1104	1152											
12½	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250										
13	520	572	624	676	728	780	832	884	936	988	1040	1092	1144	1196	1248	1300	1352									
13½	540	594	648	702	756	810	864	918	972	1026	1080	1134	1188	1242	1296	1350	1404	1458								
14	560	616	672	728	784	840	896	952	1008	1064	1120	1176	1232	1288	1344	1400	1456	1512	1568							
14½	580	638	696	754	812	870	928	986	1044	1102	1160	1218	1276	1334	1392	1450	1508	1566	1624	1682						
15	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800					
16	640	704	768	832	896	960	1024	1088	1152	1216	1280	1344	1408	1472	1536	1600	1664	1728	1792	1856	1920	2048				
17	680	748	816	884	952	1020	1088	1156	1224	1292	1360	1428	1496	1564	1632	1700	1768	1836	1904	1972	2040	2176	2312			
18	720	792	864	936	1008	1080	1152	1224	1296	1368	1440	1512	1584	1656	1728	1800	1872	1944	2016	2088	2160	2304	2448	2592		
19	760	836	912	988	1064	1140	1216	1292	1368	1444	1520	1596	1672	1748	1824	1900	1976	2052	2128	2204	2280	2432	2584	2736	2888	
20	800	880	960	1040	1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000	2080	2160	2240	2320	2400	2560	2720	2880	3040	3200
21	840	924	1008	1092	1176	1260	1344	1428	1512	1596	1680	1764	1848	1932	2016	2100	2184	2268	2352	2436	2520	2688	2856	3024	3192	3360
22	880	968	1056	1144	1232	1320	1408	1496	1584	1672	1760	1848	1936	2024	2112	2200	2288	2376	2464	2552	2640	2816	2992	3168	3344	3520
23	920	1012	1104	1196	1288	1380	1472	1564	1656	1748	1840	1932	2024	2116	2208	2300	2392	2484	2576	2668	2760	2944	3128	3312	3496	3680
24	960	1056	1152	1248	1344	1440	1536	1632	1728	1824	1920	2016	2112	2208	2304	2400	2496	2592	2688	2784	2880	3072	3264	3456	3648	3840
25	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3200	3400	3600	3800	4000
26	1040	1144	1248	1352	1456	1560	1664	1768	1872	1976	2080	2184	2288	2392	2496	2600	2704	2808	2912	3016	3120	3328	3536	3744	3952	4160
27	1080	1188	1296	1404	1512	1620	1728	1836	1944	2052	2160	2268	2376	2484	2592	2700	2808	2916	3024	3132	3240	3456	3672	3888	4104	4320
28	1120	1232	1344	1456	1568	1680	1792	1904	2016	2128	2240	2352	2464	2576	2688	2800	2912	3024	3136	3248	3360	3584	3808	4032	4256	4480
29	1160	1276	1392	1508	1624	1740	1856	1972	2088	2204	2320	2436	2552	2668	2784	2900	3016	3132	3248	3364	3480	3712	3944	4176	4408	4640
30	1200	1320	1440	1560	1680	1800	1920	2040	2160	2280	2400	2520	2640	2760	2880	3000	3120	3240	3360	3480	3600	3840	4080	4320	4560	4800

Fig. 4—Cubical contents table for rooms with 8-foot ceilings. This table is used for second floor rooms in the problem plan. Cubical contents table for rooms with 9-foot ceilings is on page 39.

double-hung windows. In arriving at the glass area for the living room, there are two sizes of windows, 30 inches by 24 inches, and 28 inches by 24 inches. Reading along the 24-inch height line on the scale, the 30-inch windows will have an area of slightly over 12 square feet and the 28-inch windows have an area of slightly less than 12 feet. Eliminating minor fractions, the room therefore will have a total of 48 feet of glass area for the four windows. Glass area is found in the same manner for all other rooms. Doors are read from the other set of scales. In this case the vertical scale is on the right side.

The net wall is the total wall area *less* the glass area. The net wall for the living room is 393 square feet, and nets for the other rooms are shown on the data sheet.

(*Continued on page* 107)

AREAS OF WALLS, FLOORS & CEILINGS

	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15	16	17	18	19	20
5	25																									
5½	28	30																								
6	30	33	36																							
6½	33	36	39	42																						
7	35	39	42	46	49																					
7½	38	41	45	49	53	56																				
8	40	44	48	52	56	60	64																			
8½	43	47	51	55	60	64	68	72																		
9	45	50	54	59	63	68	72	77	81																	
9½	48	52	57	62	67	71	76	81	86	90																
10	50	55	60	65	70	75	80	85	90	95	100															
10½	53	58	63	68	74	79	84	89	95	100	105	110														
11	55	61	66	72	77	83	88	94	99	105	110	116	121													
11½	58	63	69	75	81	86	92	98	104	109	115	121	127	132												
12	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144											
12½	63	69	75	81	88	94	100	106	113	119	125	131	138	144	150	156										
13	65	72	78	85	91	98	104	111	117	124	130	137	143	150	156	163	169									
13½	68	74	81	88	95	101	108	115	122	128	135	142	149	155	162	169	176	182								
14	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	175	182	189	196							
14½	73	80	87	94	102	109	116	123	131	138	145	152	160	167	174	181	189	196	203	210						
15	75	82	90	98	105	113	120	128	135	143	150	158	165	173	180	188	195	203	210	218	225					
16	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240	256				
17	85	94	102	111	119	128	136	145	153	162	170	179	187	196	204	213	221	230	238	247	255	272	289			
18	90	99	108	117	126	135	144	153	162	171	180	189	198	207	216	225	234	243	252	261	270	288	306	324		
19	95	105	114	124	133	143	152	162	171	181	190	200	209	219	228	238	247	257	266	276	285	304	323	342	361	
20	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	320	340	360	380	400
21	105	116	126	137	147	158	168	179	189	200	210	221	231	242	252	263	273	284	294	305	315	336	357	378	399	420
22	110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275	286	297	308	319	330	352	374	396	418	440
23	115	127	138	150	161	173	184	196	207	219	230	242	253	265	276	288	299	311	322	334	345	368	391	414	437	460
24	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336	348	360	384	408	432	456	480
25	125	138	150	163	175	188	200	213	225	238	250	263	275	288	300	313	325	338	350	363	375	400	425	450	475	500
26	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351	364	377	390	416	442	468	494	520
27	135	149	162	176	189	203	216	230	243	257	270	284	297	311	324	338	351	365	378	392	405	432	459	486	513	540
28	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336	350	364	378	392	406	420	448	476	504	532	560
29	145	160	174	189	203	218	232	247	261	276	290	305	319	334	348	363	377	392	406	421	435	464	493	522	551	580
30	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	390	405	420	435	450	480	510	540	570	600

Fig. 6—Table of wall, floor or ceiling areas for small rooms. The table for larger rooms is Fig. 7 on page 41.

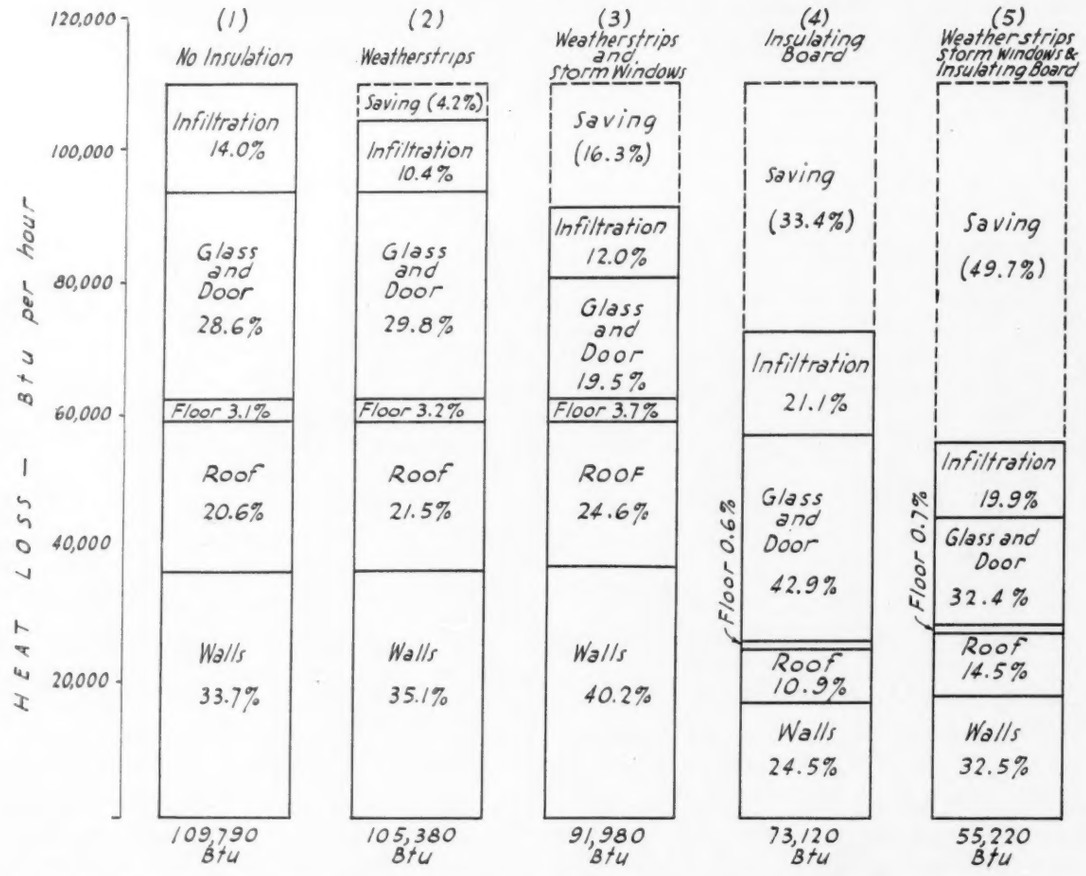


Fig. 2—Reduction in heat loss obtained by applicati on of common types of heat savers expressed as percentages and in actual heat loss reduction in Btu.

How Much Heat Goes Where?

By Paul D. Close

WHEN fuel is burned in a heating plant, a certain amount of useful heat is produced. This heat is utilized to warm the air in the rooms or spaces of the building and eventually finds its way to the outside air through the walls, roof, glass and door surfaces, and through cracks and crevices.

The percentages of heat lost through these various sources are often regarded as more or less fixed quantities. For example, a recent publication states that 50% of the heat is lost through the walls and roof, 25% through the glass and 25% through air leakage or infiltration at doors and windows. This publication further states that of the wall and roof losses, the roof is responsible for two-thirds and the walls one-third, which means, the article states, that about 35% of the total heat loss in a building is through the roof. This is explained by the fact that warm air rises.

These percentages or similar figures are quoted frequently and, while there may be instances when these figures apply with reasonable accuracy, the fact is that there is considerable variation in the actual heat loss ratios of buildings. Take for example the building illustrated in Fig. 1, which is a 7-room, brick veneer residence with attached garage. Without insulation, weatherstrips or storm windows, 33.7% of the heat will escape through the walls, 20.6% through the roof, 3.1% through the floors, 28.6% through the glass and door surfaces and 14.0% as the result of air leakage through windows and door cracks. These percentages are shown in the first column of Fig. 2.

Saving Due to Weatherstrips

Now suppose that weatherstrips are installed on all above-grade windows and doors except the garage door. This will reduce the heat loss due to air leakage 29.6% and will save 29.6% of the 14.0% due to air leakage or 4.2% of the total

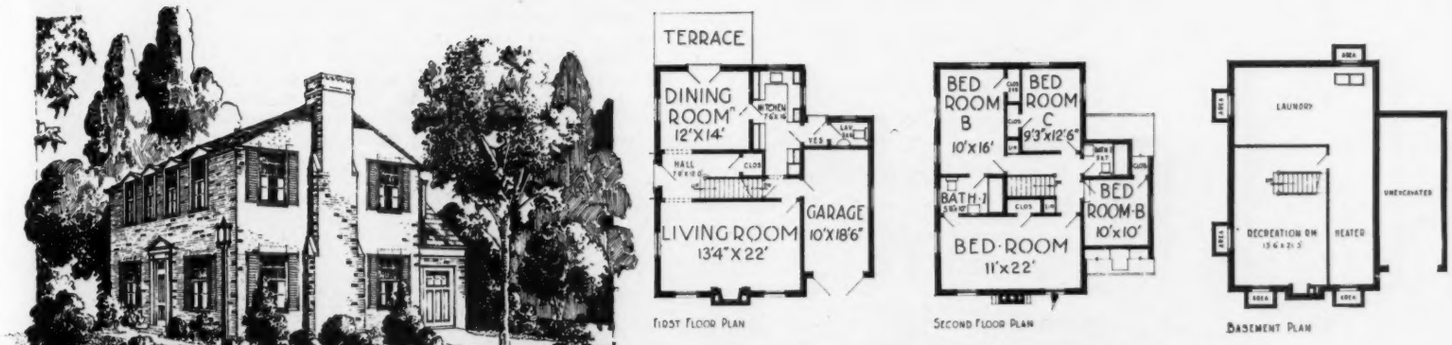


Fig. 1—Typical house and floor plans for which the reductions in Fig. 2 are shown.

amount of heat lost. The heat losses will then be divided as follows: 35.1% through the walls, 21.5% through the roof, 3.2% through the floor, 29.8% through the glass and door surfaces and 10.4% through the window and door cracks. These percentages are shown in the second column of Fig. 2.

Storm Windows

Storm windows will materially reduce the heat loss through the glass areas and, if used on all above-grade windows except the garage, the glass and door losses will be reduced 43% and the total heat loss will be reduced 43% of the 28.6% lost through the glass and door surfaces, or 12.1%. Storm doors would of course increase the saving slightly, but are not considered in this example. Weatherstrips and storm windows together will save 16.4% of the heat lost and the relative percentages will again change as shown in the third column of Fig. 2 and would be wall 40.2%, roof 24.6%, floor 3.7,% glass and door 19.5% and infiltration 12.0% or a total of 100%.

Insulation

Without any insulation, storm windows or weatherstrips, 57.4% of the heat will escape through the walls and roof and the floors of the recreation room and garage, as shown in Fig. 2. Consequently the greatest possible saving can be obtained by insulating these surfaces. Structural insulating board installed in the proper manner in these areas will save 58.2% of the heat escaping through them, and since 57.4% of the heat is lost through these areas, there is a net saving of 57.4% of 58.2%, or 33.4% of the total heat as shown in column 4 of Fig. 2. In other words, the structural insulating board alone saves about one-third of the heat lost in this case. Again, of course, the percentages change—the heat loss through the wall is now 24.5% of the total, through the roof 10.9% of the total, the floor 0.6% of the total, the glass and door 42.9% and the infiltration 21.1%.

Now if weatherstrips, storm windows and insulating board are used together, what are the heat loss percentages? The combined saving with these three items is 49.7% of the original heat loss and after this saving is taken into consideration the heat losses divide up as follows: 32.5% through the walls, 14.5% through the roof, 0.7% through the floor, 32.4% through the glass and door areas, and 19.9% due to infiltration or air leakage.

What is the significance of these perhaps bewildering percentages? First, it is evident that the percentages of heat lost through various surfaces vary considerably, even for the same building. For example, the loss due to air leakage or infiltration ranges from 10.4% of the total to 21.1% of the total, whereas the glass and door losses range from 19.5% to 42.5% of the total.

In this particular case, without insulation, storm windows or weatherstrips, about 1/3 of the heat goes through the walls, 1/5 through the roof, 2/7 through the glass and door areas and 1/7 is lost by infiltration. If insulating board, storm windows and weatherstrips are used, approximately the same fraction as originally (1/3) goes through the walls, 1/7 through the roof, 1/3 through the glass and door surfaces and 1/5 is lost by air leakage. These figures of course apply to this particular building for the conditions stated—for another building of different construction and area ratios, the figures will be somewhat different, especially in the case of a one-story structure.

Another significant by-product of these figures is the extent to which the heat losses may be mitigated by means of storm windows, weatherstrips and structural insulating board. These three items together reduce the heat losses to one-half the original amount and the fuel saving resulting therefrom will therefore pay an annual return which will soon liquidate the original cost of these items and thereafter pay a substantial return.

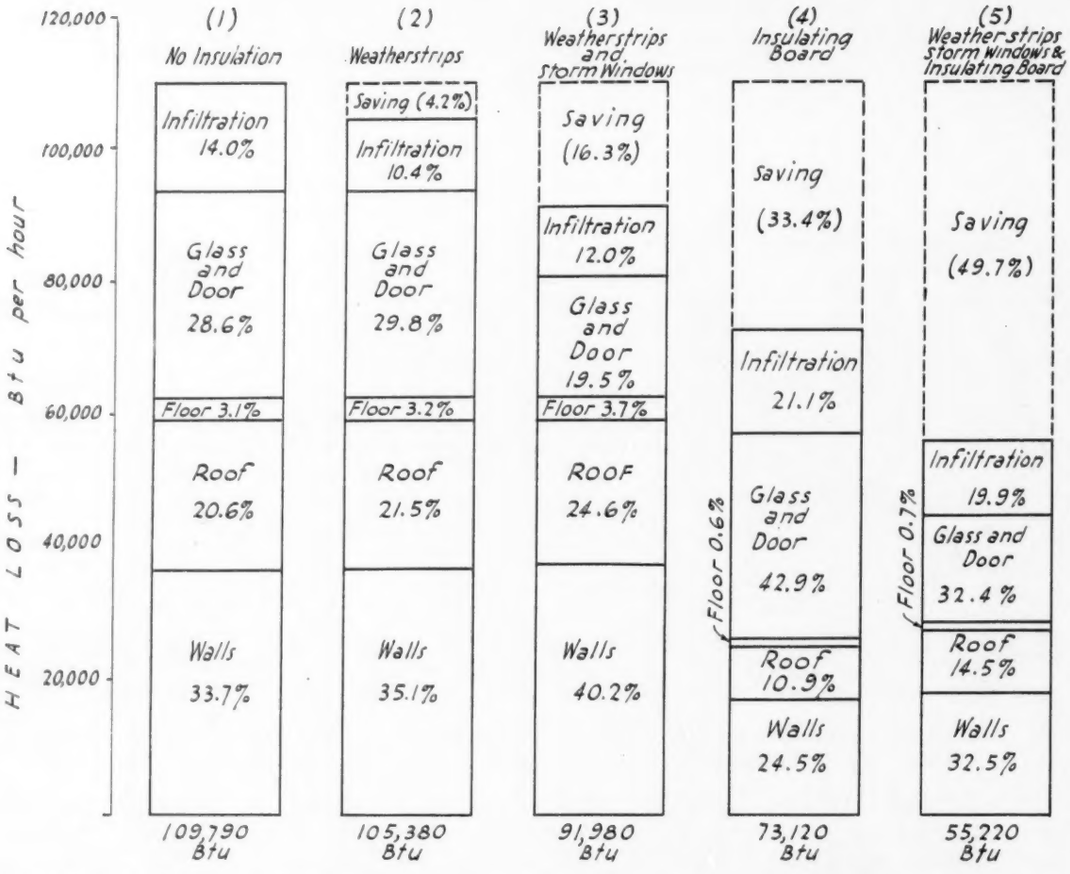


Fig. 2—Reduction in heat loss obtained by application of common types of heat savers expressed as percentages and in actual heat loss reduction in Btu.

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The percentages of heat lost through these various sources are often regarded as more or less fixed quantities. For example, a recent publication states that 50% of the heat is lost through the walls and roof, 25% through the glass and 25% through air leakage or infiltration at doors and windows. This publication further states that of the wall and roof losses, the roof is responsible for two-thirds and the walls one-third, which means, the article states, that about 35% of the total heat loss in a building is through the roof. This is explained by the fact that warm air rises.

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Saving Due to Weatherstrips

Now suppose that weatherstrips are installed on all above-grade windows and doors except the garage door. This will reduce the heat loss due to air leakage 29.6% and will save 29.6% of the 14.0% due to air leakage or 4.2% of the total

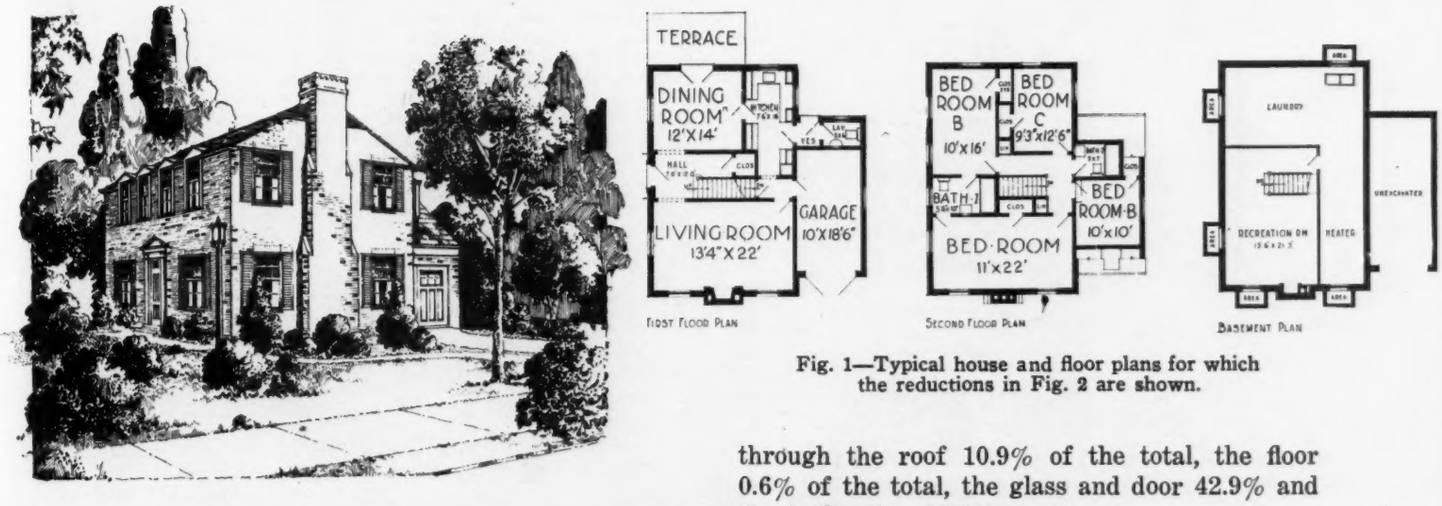

Fig. 1—Typical house and floor plans for which the reductions in Fig. 2 are shown.

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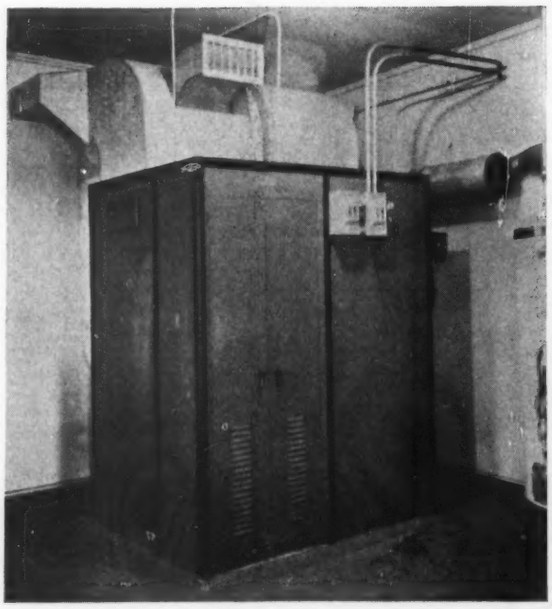
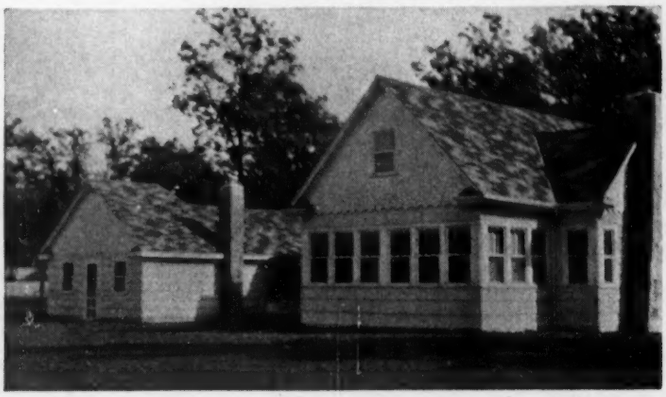
What is the significance of these perhaps bewildering percentages? First, it is evident that the percentages of heat lost through various surfaces vary considerably, even for the same building. For example, the loss due to air leakage or infiltration ranges from 10.4% of the total to 21.1% of the total, whereas the glass and door losses range from 19.5% to 42.5% of the total.

In this particular case, without insulation, storm windows or weatherstrips, about 1/3 of the heat goes through the walls, 1/5 through the roof, 2/7 through the glass and door areas and 1/7 is lost by infiltration. If insulating board, storm windows and weatherstrips are used, approximately the same fraction as originally (1/3) goes through the walls, 1/7 through the roof, 1/3 through the glass and door surfaces and 1/5 is lost by air leakage. These figures of course apply to this particular building for the conditions stated—for another building of different construction and area ratios, the figures will be somewhat different, especially in the case of a one-story structure.

Another significant by-product of these figures is the extent to which the heat losses may be mitigated by means of storm windows, weatherstrips and structural insulating board. These three items together reduce the heat losses to one-half the original amount and the fuel saving resulting therefrom will therefore pay an annual return which will soon liquidate the original cost of these items and thereafter pay a substantial return.



Oil-fired Hess furnace and house exterior. On facing page—general plan and details of the system. The "Flannigan" installation, is a good example of overcoming obstacles; of making a success of a job which many dealers might be afraid to tackle and would let go to steam or water heating. The Hess Warming & Ventilating Co. report another similar installation (heat delivery 300,000 Btu.) has shown successful zero weather tests.



Ducts in a Tunnel, In a Basementless House

IN THE attractive new home of radio sports reporter "Pat" Flannigan at Wonder Lake, outside Chicago, the heating system installed by contractor Alvin Lohbauer of Elgin, Illinois, has an interesting feature in the underground tunnel which carries the warm air and return trunks from the furnace room above ground to living quarters in the main wing.

The tunnel was selected because there is no basement and the air had to be conveyed either underground or overhead through the open "roof" of the patio. It was decided that a tunnel could be more easily and thoroughly insulated against heat loss than an exposed duct and the manner of insulating is shown in a detail on the plan. Furthermore, the engineering department of the Hess Warming and Ventilating Company, Chicago, and Contractor Lohbauer favored low registers, so supply ducts carried between the floor joists and the earth saved the wall stacks necessary for high side wall registers or attic mains.

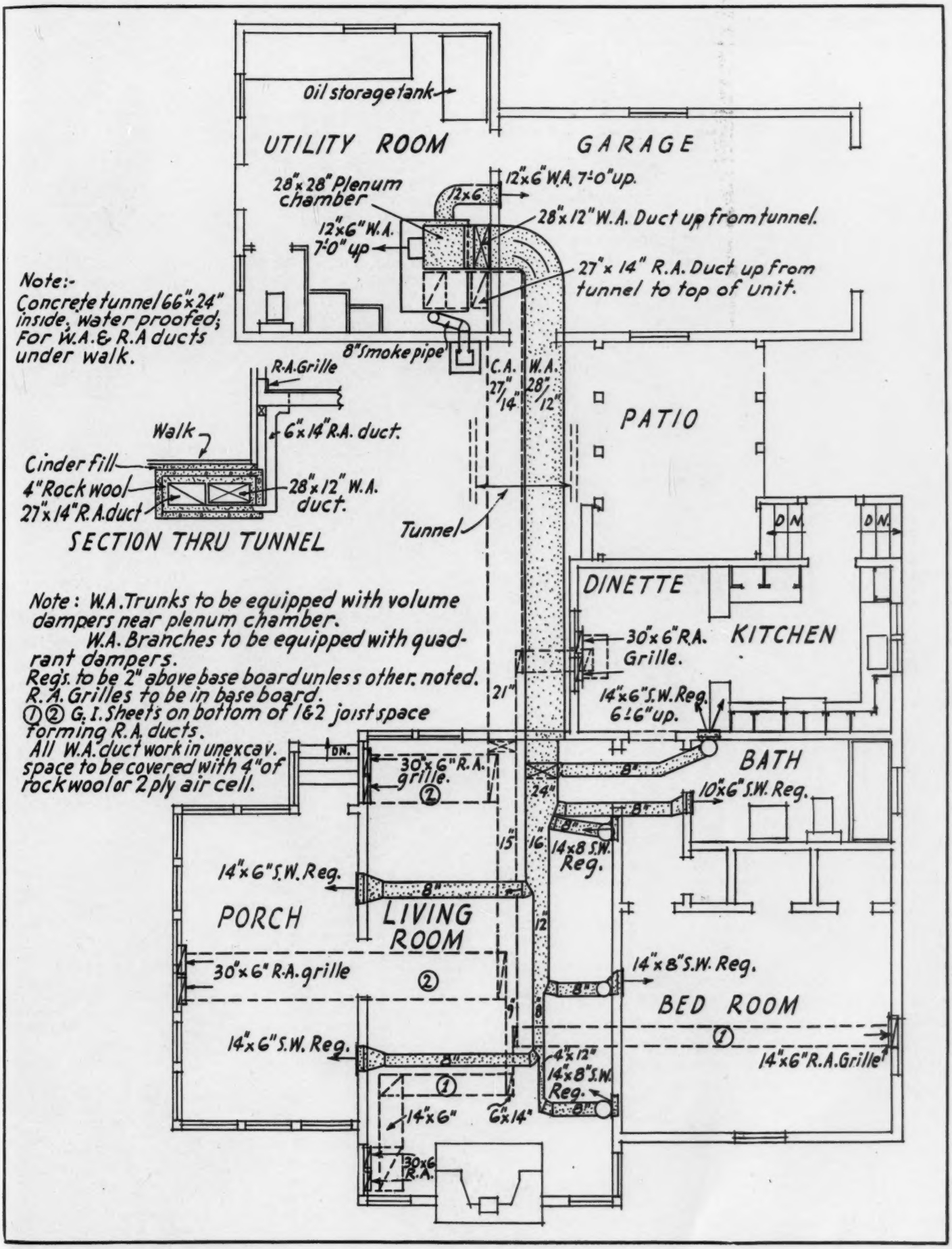
General Features of Design

The heat loss of the house, including the utility room and garage, is 80,000 Btu. The Hess oil-fired furnace can deliver from 100,000 to 150,000 Btu depending on nozzle size and air delivery—providing a generous excess capacity. The blower delivers 1,000 cfm for a designed register temperature of 140 degrees. The system is sized for a temperature difference of —10 degrees to 70.

As the plan shows, supply registers, except as noted, are placed 2 inches above the baseboard; returns are in the baseboard. The furnace was placed in a corner of the utility room just far enough from the wall to permit dropping supply and return ducts into the tunnel. When the tunnel reaches the house foundation the ducts are brought above ground and run between joists and earth with round pipe supply branches as shown and panned joists spaces for return. All ductwork in unexcavated spaces is wrapped with balsam wool wound loosely around the pipes.

The two critical rooms are the living room and sun porch. These face the lake and the full sweep of the winds and have a large ratio of glass to exposed wall—accordingly, each of these rooms has two warm air registers, placed as shown to carry warm air to the exposed walls. Balance was obtained through adjustment of dampers in each warm air branch.

The Hess oil-burning furnace used employs the counter-flow principle with return air passing first through the filters, then through the blower, then over the heat exchanger in the bottom of the blower compartment and then over the all-welded, square combustion chamber. Not much plenum space was available (see photograph), but adoption of vanes in plenum and drop elbows maintained air temperature uniformity at the tunnel entrance.


Oil storage tank
UTILITY ROOM
GARAGE
28"x28" Plenum chamber
12"x6" W.A. 7'-0" up.
12x6
28"x12" W.A. Duct up from tunnel.
12"x6" W.A. 7'-0" up
27"x14" R.A. Duct up from tunnel to top of unit.
Note:-
Concrete tunnel 66"x24" inside, water proofed; For W.A. & R.A ducts under walk.
8" Smoke pipe
R.A. Grille
C.A. 27"/14"
W.A. 28"/12"
PATIO
Walk
6"x14" R.A. duct.
Cinder fill
4" Rock wool
27"x14" R.A. duct
28"x12" W.A. duct.
SECTION THRU TUNNEL
Tunnel
DN.
DN.
DINETTE
KITCHEN
30"x6" R.A. Grille.
14"x6" S.W. Reg. 6'-6" up.
21"
Note: W.A. Trunks to be equipped with volume dampers near plenum chamber.
W.A. Branches to be equipped with quadrant dampers.
Reg's. to be 2" above base board unless other. noted.
R.A. Grilles to be in base board.
① ② G.I. Sheets on bottom of 1&2 joist space forming R.A. ducts.
All W.A. duct work in unexcav. space to be covered with 4" of rock wool or 2 ply air cell.
DN.
30"x6" R.A. grille.
②
BATH
8"
24"
10"x6" S.W. Reg.
15"
16"
14x8 S.W. Reg.
14"x6" S.W. Reg.
8"
PORCH
LIVING ROOM
12"
30"x6" R.A. grille
②
14"x8" S.W. Reg.
BED ROOM
8"
9"
①
14"x6" R.A. Grille
14"x6" S.W. Reg.
8"
4"x12"
14"x8" S.W. Reg.
①
14"x6"
6"x14"
30x6 R.A.

A Specification for

Fan-Furnace Systems

In the October issue W. W. Howe presented a simplified design method for fan-furnace systems with a suggested data sheet and time-saving tables. The author also included a specification which, when filled in and signed furnishes both owner and contractor with a complete understanding of what is to be installed. Space did not permit publishing the specification but, because the design method proved of interest, we now show the form Mr. Howe recommended.

SPECIFICATIONS FOR THE INSTALLATION OF A FIVE POINT AIR CONDITIONING SYSTEM

OWNER ..... ADDRESS .....

ARCHITECT ..... CITY .....

The heating contractor is to furnish all materials and labor for a complete system, ready to operate. The system is to be installed with these specifications and the accompanying plans and must meet with the approval of the designing engineer.

FURNACE.....(name).....INPUT RATING.....BTU/HR.
FAN to operate at.....R. P. M. and deliver.....C. F. M. against a total pressure of.....in. water col.

MOTOR.....(name).....To be of the capacitor type equipped with automatic cut-off switch which will shut off current if the motor exceeds normal temperature. Motor to be equal to the Westinghouse type FJ with Thermoguard. Motor to be.....H. P.

CONTROLS.—Furnish the controls checked in the following list:

Room thermostat with positive night cut-off switch .....
High limit temperature control .....
Gas pilot with electric circuit closed by heat .....
Solenoid type electric gas valve. Size .....
Fan motor control .....
Summer switch .....
Time clock .....

The high limit control and fan switch may be combined in one instrument.

DUCTS.—Contractor will install a complete system of warm air and cold air ducts, substantially as shown on the plans. Duct metal and duct supports to be fully equal to the work to be done, durable and workmanlike.
Install locking type dampers where shown on plans.
Cover all main and branch ducts with aircell covering.....in. thick. Seams to be covered with flat asbestos paper pasted to covering.

DOOR FOR SUMMER CIRCULATION.—Install slide door in cold air duct close to furnace. Door to be accessible and easily operated. Door shall be not less than.....in. x.....in. in size.

REGISTERS.—All registers shall be as made by Hart and Cooley Mfg. Company, or equal. The types and numbers shown refer to the H & C registers.

Warm air registers.... { 3 piece side wall—adjustable bar—Type 843 / 2 piece extended base-board Type No. 120 / Floor register No. 200

COLD AIR GRILLS... { Side Wall—Type 776 / Floor Type—No. 266

Warm air registers to be finished in.....(color).....
Cold air grills to be finished in.....(color).....

FILTERS.—Furnace to be equipped with filters and filter cabinet.
Total area of filters to be not less than.....sq. in.
Construction of filters and material of which they are made to meet approval of engineer or architect.

HUMIDIFYING DEVICE.—Furnish and install humidity pan not less than..... in. by.....in. and not less than 2 in. deep. Water level to be automatically maintained by ball float housed in compartment outside of furnace jacket. Float valve to be connected to city water supply by 1/4" copper pipe. This pipe to be equipped with small shut-off valve. Thermostatic type of water valve control not approved.
Water pan to be furnished with overflow pipe so arranged that any excess water will be disposed of without damage to furnace or furnace room.

CONTRACTOR WILL FURNISH:
Gas line from meter to furnace.....in. dia. Existing gas lines may be used providing said lines are of ample size to furnish required cu. ft. of gas.
All necessary electrical wiring which is to be installed in accordance with electrical codes governing such work. 110 V. lines must be enclosed in conduit or rigid conduit. Transformers must be enclosed in metal box and must not be attached to wood in such a way that burning of the transformer might set fire to the wood.
All current furnished to the controls and to the motor must be from a box switch equipped with two fuses. This box switch shall be placed in a convenient position so that the current to the system can be easily shut-off by the owner.

GUARANTEE.—Contractor shall guarantee the equipment furnished and his workmanship for a period of one year after the system is inspected and accepted. Contractor shall check the gas flow and see that the furnace is using not less than.....cu. ft. of gas per hr., nor more than 10% above this figure. Contractor shall check air flow from all registers and adjust branch dampers as may be required.

SYSTEM.—The system is guaranteed to be capable of maintaining a temperature of 70 degrees in all rooms provided with warm air registers when the outside temperature is 30 degrees, or above 30 degrees. This guarantee is made by the seller of this equipment. Filters are designed to remove about 95% of all dust and dirt. Filters will require cleaning at intervals and renewal when necessary. Such cleaning and renewal is to be done by the owner, or by the contractor at the owner's expense.
The humidity pan is not designed to maintain any specific relative humidity, but experience has proved that such humidity pans supply sufficient moisture for good practice.
The system is designed to furnish partial summer cooling by the use of the fan in the summer time. When used for summer cooling, the door in the cold air duct is to be opened by the owner.

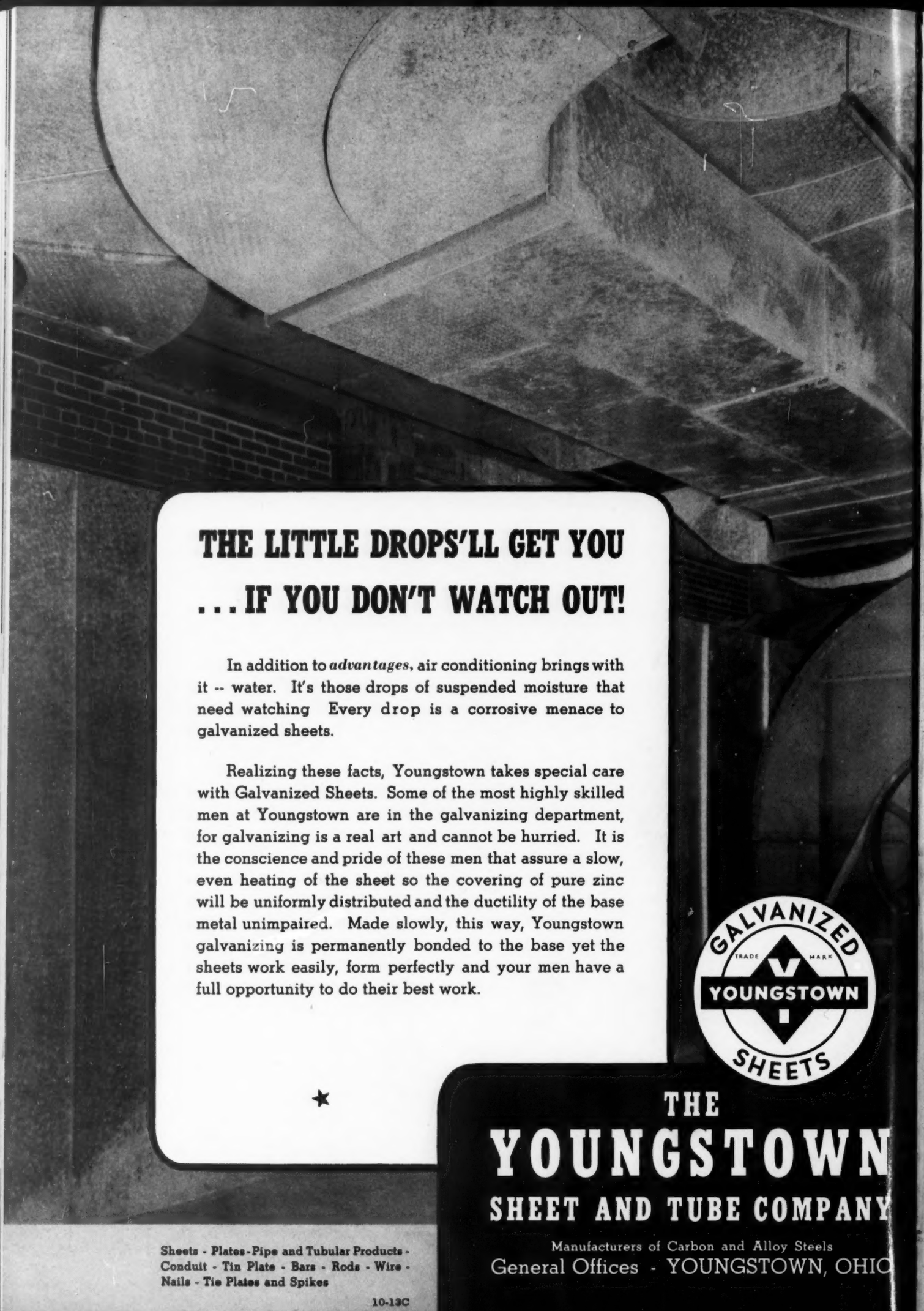
TO BE PROVIDED BY OWNER.—Owner is to provide a suitable flue not less than.....in. dia. The contractor will connect furnace to the flue by a copper vent, not less than.....in. dia. Owner is to furnish electrical supply not less than 10 ft. from the furnace and water supply connection not less than 10 ft. from furnace. Owner is to supply concrete floor upon which the furnace may be set if the house is under construction. If the house is completed and the basement has dirt or wood floor, the contractor is to supply concrete base for furnace as shown on plans.

Attention is hereby called to the fact that marked fuel economy will be had if attic and basement ventilators are closed during the winter. The closing of such ventilators is to be done by the owner or at his expense.
Weather stripping of windows and doors and insulation of attic floors is strongly recommended for fuel economy.

AMERICAN ARTISAN

SHEET METAL SECTION

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



THE LITTLE DROPS'LL GET YOU ... IF YOU DON'T WATCH OUT!

In addition to *advantages*, air conditioning brings with it -- water. It's those drops of suspended moisture that need watching Every drop is a corrosive menace to galvanized sheets.

Realizing these facts, Youngstown takes special care with Galvanized Sheets. Some of the most highly skilled men at Youngstown are in the galvanizing department, for galvanizing is a real art and cannot be hurried. It is the conscience and pride of these men that assure a slow, even heating of the sheet so the covering of pure zinc will be uniformly distributed and the ductility of the base metal unimpaired. Made slowly, this way, Youngstown galvanizing is permanently bonded to the base yet the sheets work easily, form perfectly and your men have a full opportunity to do their best work.

GALVANIZED TRADE MARK YOUNGSTOWN SHEETS

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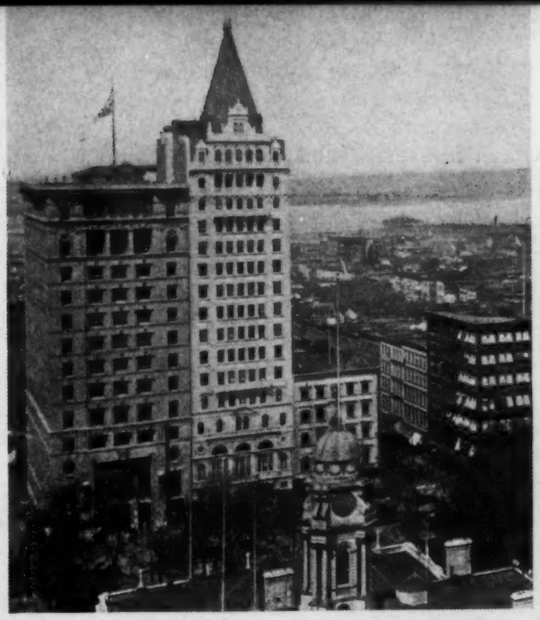
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

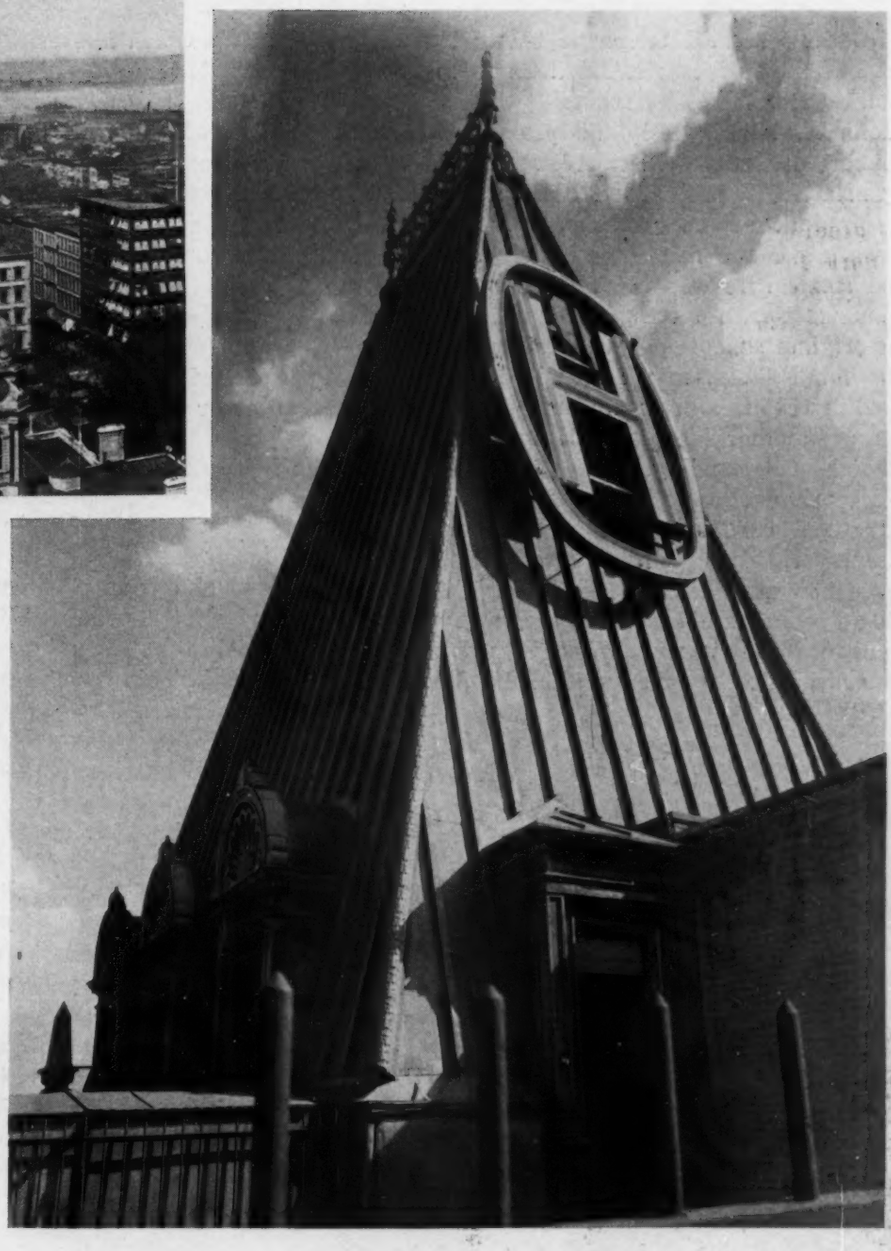
Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes

10-13C



The Home Life building in 1894, the year the building was first occupied. The copper and tile roof was then a towering landmark of lower New York.

All photographs by courtesy of American Brass Co.



The new copper roof which replaces the original tile. The cresting was found in perfect condition after 47 years exposure to rain, sleet, snow and temperature changes. The new roof is 20-oz. crimped Anaconda copper.

Copper Resists 50 Years of Severe Exposure

THE home office of the Home Life Insurance Company of New York has a new copper roof.

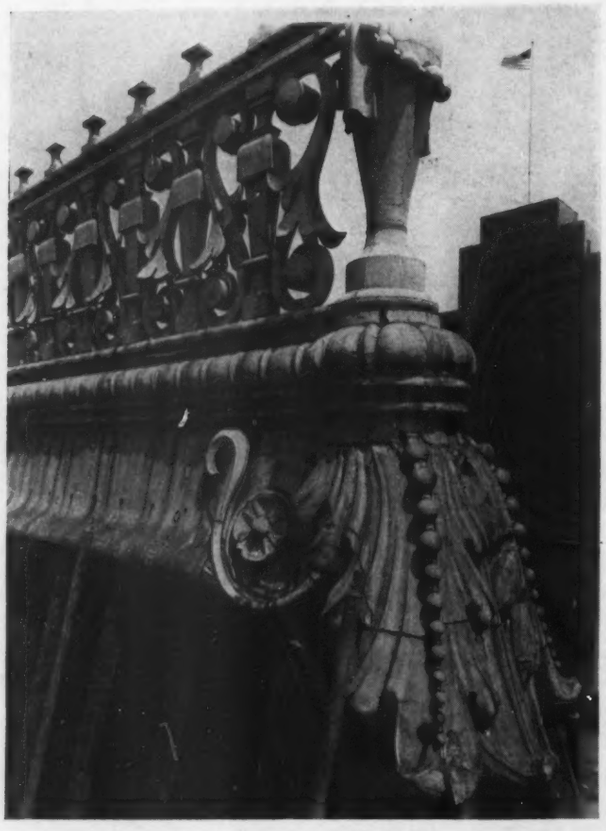
New Yorkers know this building as one of the landmarks of lower Manhattan. The architectural and construction industries know this building as the first fire-proof structure to be built in New York and as the building world's first proof of the value of fire-proof construction. Under construction in 1893 and occupied in 1894 a fire destroyed the adjacent building in 1898, burning out the upper six floors of the Home Life building, but doing no serious damage to the walls or roof or framework.

There is an interesting story connected with this copper roof. The original tile roof was installed by the New York roofing firm of Nicholson and Galloway in 1893. Nicholson and Galloway are still in business—have been so continuously—and through an interesting circumstance, installed the new copper roof. It so happened that the original superintendent of the building is still "on the job" and remembered Nicholson and Galloway as the original roofers; looked them

up in the classified telephone book; found the firm still in business; called them in to recommend the necessary alterations.

John E. Nicholson is the present Nicholson member of this "oldest New York roofing organization." His father, John E. Nicholson, was graduated from Princeton in 1888 and went to work for the firm immediately and, at the time Home Life was roofed, had been engaged in outside work for the firm for some five years. The original Nicholson—grandfather of the present John E.—started the firm in 1849, but was killed in 1885 in an accident during the construction of another Broadway landmark, the first Standard Oil Building.

The original tower roof was built of Spanish tile nailed to "Book Tile" with copper nails. After nearly fifty years of service a tile would loosen now and then and slide out. This constituted a pedestrian hazard and the owners decided to re-roof the tower. What was found, and recommended is best described by Mr. Nicholson:



Above — Closeup of original copper cresting showing perfect condition. The holes in the apron were left after some old lightning protection was removed.

"We called and examined the tower from the nearest vantage point, using field glasses. We thought, of course, that the ornamental copper work of the ridge cresting would have to be removed, since the cresting had withstood almost fifty years of the most severe service. We estimated accordingly. But when scaffolding was in place and we were able to examine the copper work at close hand we were amazed and gratified to find the copper in perfect condition and not even in need of repairs. This was also found true of all other ornamental copper such as dormer trim, mouldings, finials, etc.

Factors Promoting Long Life

"The question has been asked—'why this particular copper remained in good condition through so many winters, through so many snow and sleet storms and despite the high winds to which the tower has been subjected for fifty years.' This is not easy to answer, because our examination showed application just as we handle such work today—rivets, locked seams, solder, internal bracing, etc.—but, maybe, the men who put this work together in 1893 *took a little more time* and *a little more pride* than do some of the mechanics today. Those men worked at a lower wage scale and usually had more apprentice training.

"Probably, also, the contractor's price was not whittled down until he had to rush the job through in a specified time in order to come out without a loss.

"After examining the whole tower from the scaffolding we made the following recommendations: Remove all tile at once. Cover the roof with 30-pound saturated felt paper. Install wood, tapered battens, bolted through the book tile with plates on the inside. Then lay 20-ounce crimped

Left — Contractor Nicholson (straw hat and beard) and advertising manager Joseph McDonald of American Brass inspecting the old cresting. No failures were found despite long exposure. Construction was identical with "good" construction today.

Fifty year old ornamentation and new dormer roof and flashing ready for roof pan sheets. Only solder used on job was at these points.

copper sheets in the usual manner using the least possible amount of solder and making adequate provision for free movement in all directions.

"This substitution of copper for the original Spanish tile relieved the steel framing of approximately 58,000 pounds of dead weight.

"No nails were driven through the sheets and all copper is held in place by a free use of copper cleats nailed with copper nails. Specific methods of folding and cleating the pan sheets between battens and at the stamped hip-roll are shown in the photographs. Where the roof sheets were placed underneath the old cresting (see photograph), the roof sheets were run up as far as possible (a minimum of 18 inches) under the cresting and the base or apron of the cresting was then trimmed and locked to an overlapping flashing. The hip ornamentation shown in one of the photographs is new and was stamped by Miller and Doing of New York.

"Crimped copper was recommended because we believe crimped sheets lie flatter than smooth sheets and also take care of expansion and contraction in the direction against the corrugations. We use crimped sheets whenever possible and on one recent installation all base flashing is crimped sheet.

"The photographs show actual application. The crimps were run horizontally so that the space between the upright fold of the pan sheet and the batten took care of movement horizontally, while the crimps provided for movement up and down. Pan sheets were cut 8 feet long and (as one photograph shows) only the center pan is without hip miter on the front and back of the tower. The two sides have several pan rows without miters.

"All horizontal seams are loose-locked and filled with compound. The most difficult connection is where a hip ornamentation intersects a batten,

(*Continued on page* 104)

Below—Cleating crimped copper pan sheets of new roof. Right—Intersection of pan sheet, batten cap and ornamented hip showing solderless construction. Hip sections were stamped.

Design and Construction Details for A Pneumatic Grain Conveying System

THE Houston Blow Pipe and Sheet Metal Works, Houston, Texas, is known all over the world for the material handling systems designed and installed by the company. A very large and notable installation was made in Russia; several in Mexico; with smaller systems scattered wherever materials must be handled pneumatically.

Organized some thirty-five years ago, the firm became widely known as an organization which could solve the problem of handling lint from cotton linters—something which had long been a serious obstacle. Likewise, the firm designed and installed waste wood dust and shaving collecting and conveying systems from planing mills to furniture factories and waste wood incinerators to consume sawdust, shavings, blocks, particularly in electrically operated plants without boilers for waste consumption.

The organization has been active in several other fields—one such is the handling of grain, which is a major service in the port of Houston. The drawings and details show a typical grain handling system for a brewing company. Grain is received at the elevator in cars. The grain must be elevated and deposited in storage bins. Flow of grain must be positive, rapid and attention free. The system also contains some features especially pertinent to grain handling.

Intake Pipe and Separator

Flexible nozzles are used inside the cars. These nozzles connect to the outside pipe riser through which grain flows to the top of the elevator. The motive force is the involute impeller blower shown on the roof. The intake pipe is built of 16-gauge black iron welded throughout for air tightness. Joints in the erected pipe are gasketed flanges, drawn tight. The elbows in the line are specially designed by the firm to avoid abrasion of grain. This design is a patented feature.

The separator into which the grain flows and drops out of the air stream has a larger-than-usual diameter, but has otherwise standardized dimensions. One feature, however, the firm believes makes their separators outstanding. That is the entry nozzle into the cyclone. It will be noted on the plan and the detail that the entry nozzle, instead of being at the top and tangent to the circumference, enters the cyclone at the level of the cone and directly into the center of the circle.

This entry nozzle was developed after years of investigation for more efficient entries. The entry section is rectangular, with the bottom sloping downward, while the top changes to a downward sweeping deflector inside the cyclone. The entry fitting, having considerably larger area than the round pipe preceding, permits air stream velocity to drop outside the separator so that velocity change does not all have to occur inside the separator. The baffle prevents any grain from striking the separator walls, thus reducing abrasion. The separator is built of 10-gauge black iron.

Air from the separator flows through the blower and out into the atmosphere as usual.

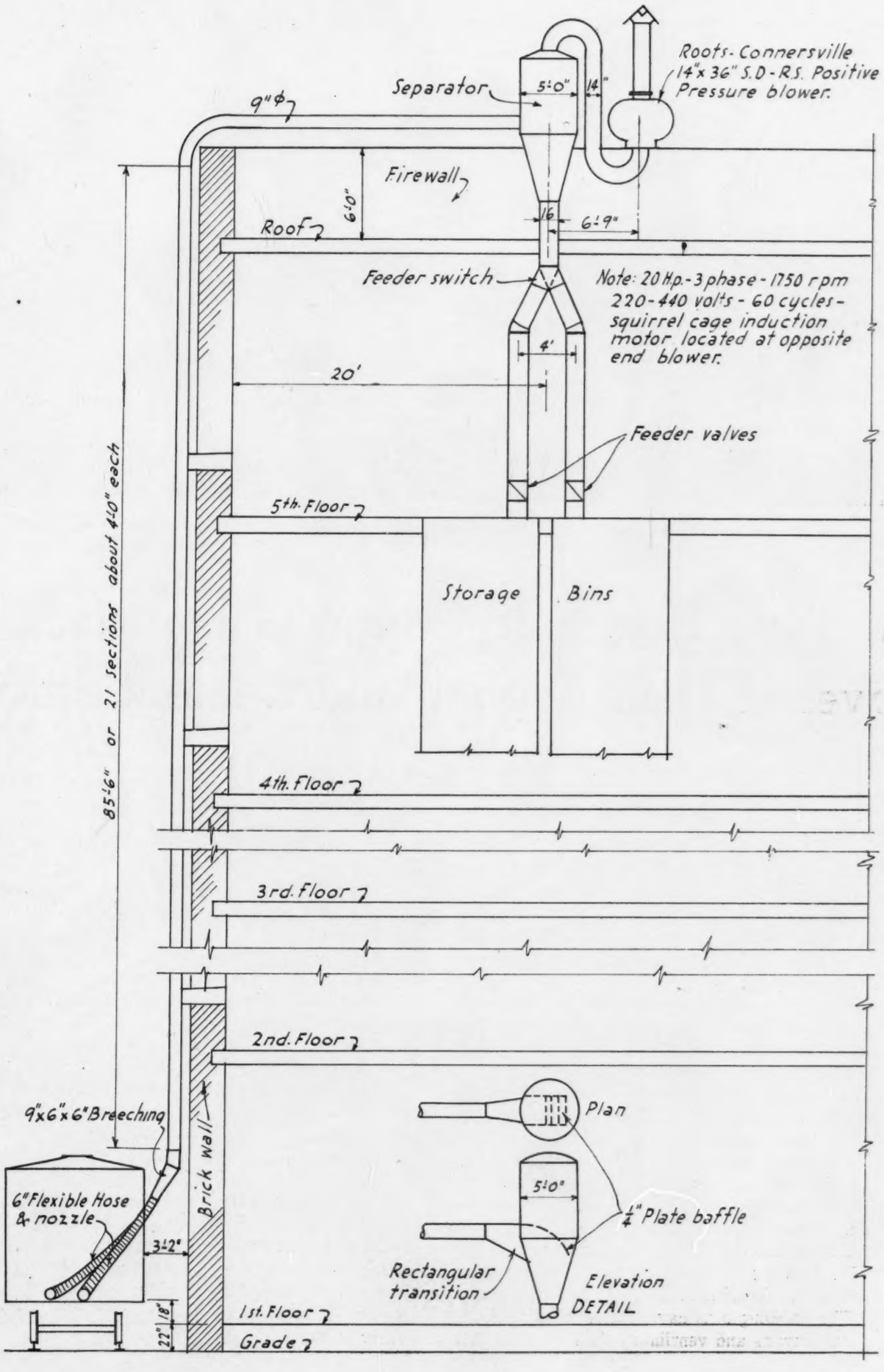
Grain settling out of the air in the separator falls through the hopper and then into storage tanks. The plan shows a feeder valve in the line to each tank. This feeder valve is another of the firm's controlled features. The purpose of the valve is to let grain through but prevent the blower from sucking air from the storage bins. Most of the usual valves are rotary in action and mechanically operated; Houston's is automatic and non-mechanical.

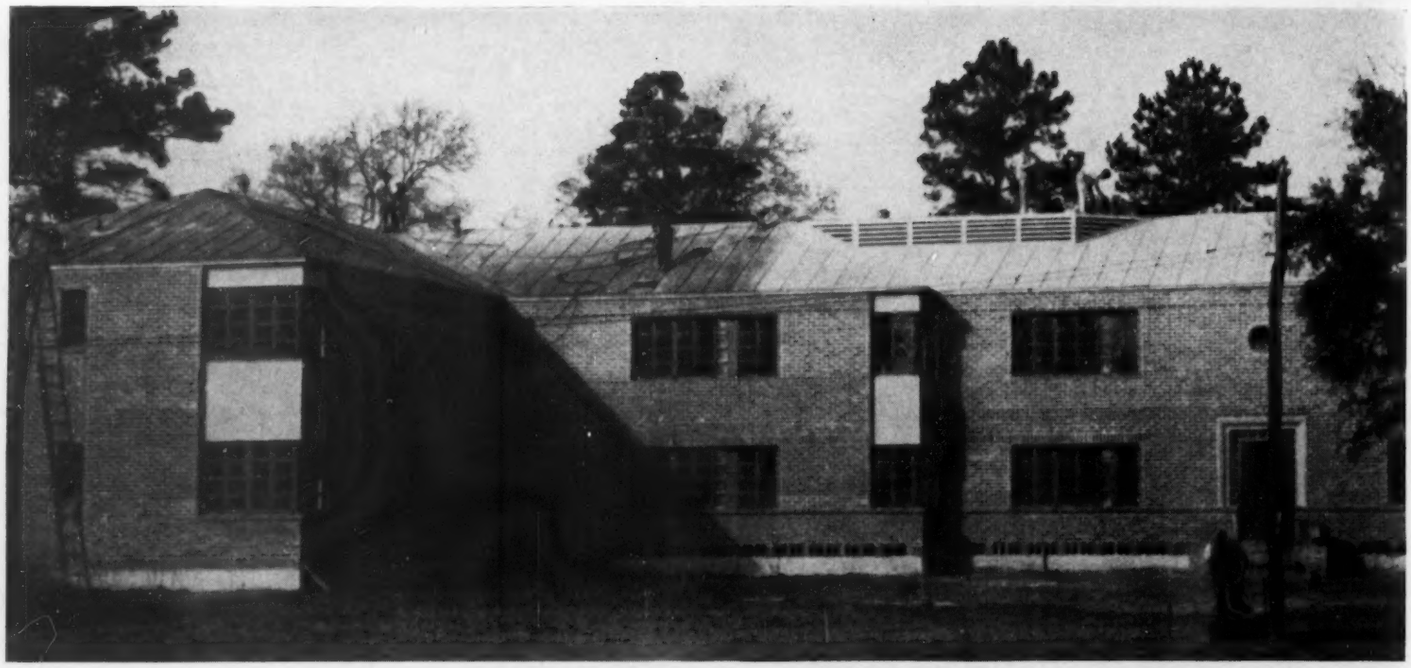
Operating Details

The operating characteristics of the system are as follows: the blower has a capacity of 5,000 cfm and the system operates at two pounds per square inch suction. The intake pipe is 9 inches in diameter and the system provides four cfm for each pound of grain. The capacity is approximately 1,000 pounds of grain per minute.

Houston Blow Pipe follows the procedure of making all parts of installations—pipes, fittings, separators, framing, etc.—in the shop in Houston and shipping the items to the job ready for erection. On many jobs the erecting crew is sent to the job while the customer furnishes the necessary common labor.

In addition to material handling systems the firm is also equipped to do any type of heavy gauge plate work; also lighter gauge work. The firm also manufactures items like sanitary garbage cans, refuse incinerators, tanks, and are alloy metal fabricators and specialists of wide experience.


Roots-Connersville 14"x36" S.D-R.S. Positive Pressure blower.
Separator
5'-0"
14"
9"ϕ
Firewall
6'-0"
Roof
16
6'-9"
Feeder switch
Note: 20 H.p.-3 phase-1750 rpm 220-440 volts-60 cycles-squirrel cage induction motor located at opposite end blower.
4'
20'
Feeder valves
5th. Floor
Storage
Bins
85'-6" or 21 sections about 4'-0" each
4th. Floor
3rd. Floor
2nd. Floor
9"x6"x6" Breeching
Brick wall
Plan
5'-0"
1/4" Plate baffle
6" Flexible Hose & nozzle
3'-2"
Rectangular transition
Elevation
DETAIL
22"
1'-8"
1st. Floor
Grade



Exterior closeup of one of the housing units in the Park Lane development. Standing seam galvanized roof in place and in process of being covered with the asphalt-cement stucco coating.

New Type Roof—28-Gauge Galvanized Iron Covered With Asphalt and Cement Stucco

By C. A. Loeffler

THE choosing of the proper type of roofing for Houston's new million dollar Park Lane Apartment project—involving about 800 squares of roofing material—was one of the many problems which faced the firm of Talbott Wilson and Irwin Morris, Houston architects and designers of the buildings.

With the cooperation of Lester W. Brusse, a Houston sub-contractor, a 28-gauge, galvanized iron roof, topped with a 3/16-inch coating of asphalt and stucco, was decided upon.

The asphalt and stucco dressing would have the following effect, it was found:

1. It would prevent rust and corrosion.
2. It adds a decorative note to the roof.
3. It possesses sound-deadening qualities.
4. It possesses the virtue of reflective insulation. Competent architects pronounce it the best insulating material they have ever seen.

The building specifications recite the following method for the application of the roof:

"The building is to have a sheet metal roof.

"All louvers and ventilators shall be given this treatment. The inside of gutters shall receive the same asphalt treatment as the roof.

"The exterior of all gutters and downspouts shall be kept absolutely clean of all asphalt and stucco spray.

"Materials to be used are:

"Asphalt, flint coat C-13E Special.

"Sand, to be clean, sharp sand, free from silt and loam.

"Water to be from well on property.

"Cement Incor.

"Preparation of surface: Check the area to be treated for accumulation of dust or other foreign matter and remove same by washing.

"Preparations of Materials for Priming: Use four parts of Flint-cote Emulsion C-13E to one part of water. Mix thoroughly and strain through 16-mesh screen. Spray this mixture over the metal until the area is thoroughly coated, using 1⅓ gallons of undiluted emulsion to 100 sq. ft. The mixture can be adjusted to meet conditions, enrich or thinned as is necessary with water. Allow to dry.

"Second Coating: To a mixture of four parts of C-13H.P.C. and 1½ parts of water add 8 parts of carefully screened sand. Spray this mixture over the primed metal until the area is roughened. Do not build up thickness. Use ⅔ gallon of undiluted emulsion to 100 square feet.

"Stucco Mixture and Application: Screen thoroughly a mixture of three parts sharp, clean sand and one part of Incor cement; add one part clean water.

"Over the prepared area spray this cement stucco. Move the spray at a rate which will not permit the whole roof to be covered on the first application. Many successive thin coats are more desirable than one or two heavy applications. If conditions affecting the setting process have a tendency to slow it up, longer time should be taken between coatings. Vary the area to be worked with the speed of drying and as soon as stucco appears to be dry, another coating should be applied. For two days after stucco has been applied a fine spray of water should be used to cure the material. Stucco should be applied until the asphalt is not visible.

"Decoration: Apply Oriental Exterior Stucco or approved equal as a finish coat over the roof. It shall be tinted a color as determined by the architect.

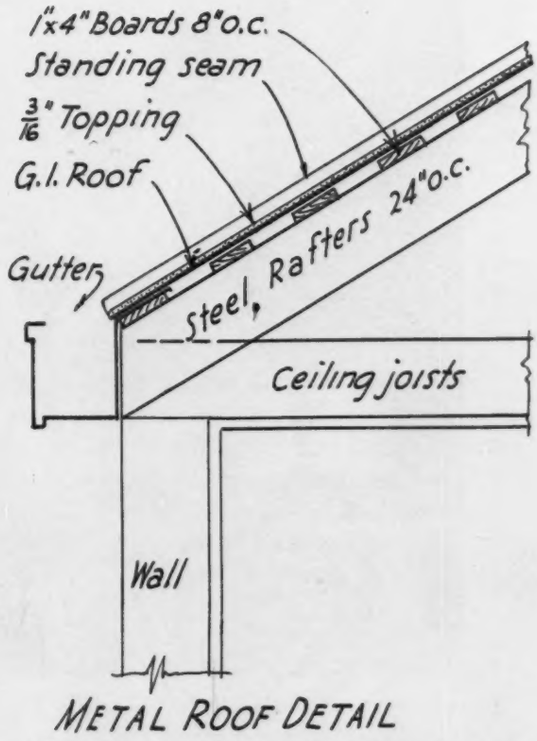
"Guarantee: The Contractor guarantees the above finish to protect the roof from deterioration and rust for a period of 20 years and shall repair it at his own expense in event of failure."

Application and Cost

The 28 gauge galvanized iron is supported by 1x4 inch wood lath spread 8 inches on center, on joists spaced 24 inches. A solid support was not used, in order to allow for condensation to be taken up by evaporation.

The roof itself is of the conventional standing seam type.

The cost, too, is very reasonable, considering the 20-year guarantee which goes with the installation. The average job will run about seven dollars per square, but, of course, on big jobs like the Park Lane project, the cost is naturally lower.



METAL ROOF DETAIL

Detail showing rafters, spaced sheathing, galvanized iron and new topping as applied on Park Lane buildings.

Because of all of these qualities, the designers believe that this is one of the most efficient roofs now available.

The project itself consists of 14 buildings, with a total of 140 units. It is situated in a beautifully wooded two-acre tract, in a splendid portion of the city.

R. C. West is the general contractor. Seline Sheet Metal Works laid the 28 gauge galvanized iron which was coated as described.

Air view of the complete Park Lane housing group, million dollar project in Houston, Texas. All roofs are covered as described.

Wrought Iron Ducts in a Sewage Plant

IN the construction of sewage treatment works and mechanisms, the problem of corrosion must always be kept in mind for sewage is an active corrosive agent and only corrosion resisting materials will stand up in service. Some sewage mechanisms and spaces are, of course, subject to more active corrosion than others, but even materials not directly in contact with the sewage are subject to atmospheric corrosion so the careful engineer selects his materials thoughtfully.

A case in point is the screen and grit chamber of the Minneapolis-Saint Paul Sanitary District pictured in the photographs. The sewage from the system comes through this room first and here all coarse materials and rubbish are screened out. Because of odors, the screen room is thoroughly ventilated. Because of corrosive atmosphere, the ventilating system is constructed of wrought iron sheets which were specified by the engineers. As further protection, all sheets are galvanized.

The duct system shown was installed by Northwestern Roofing & Cornice Company of St. Paul. A. L. Gaughan operates the sheet metal department.

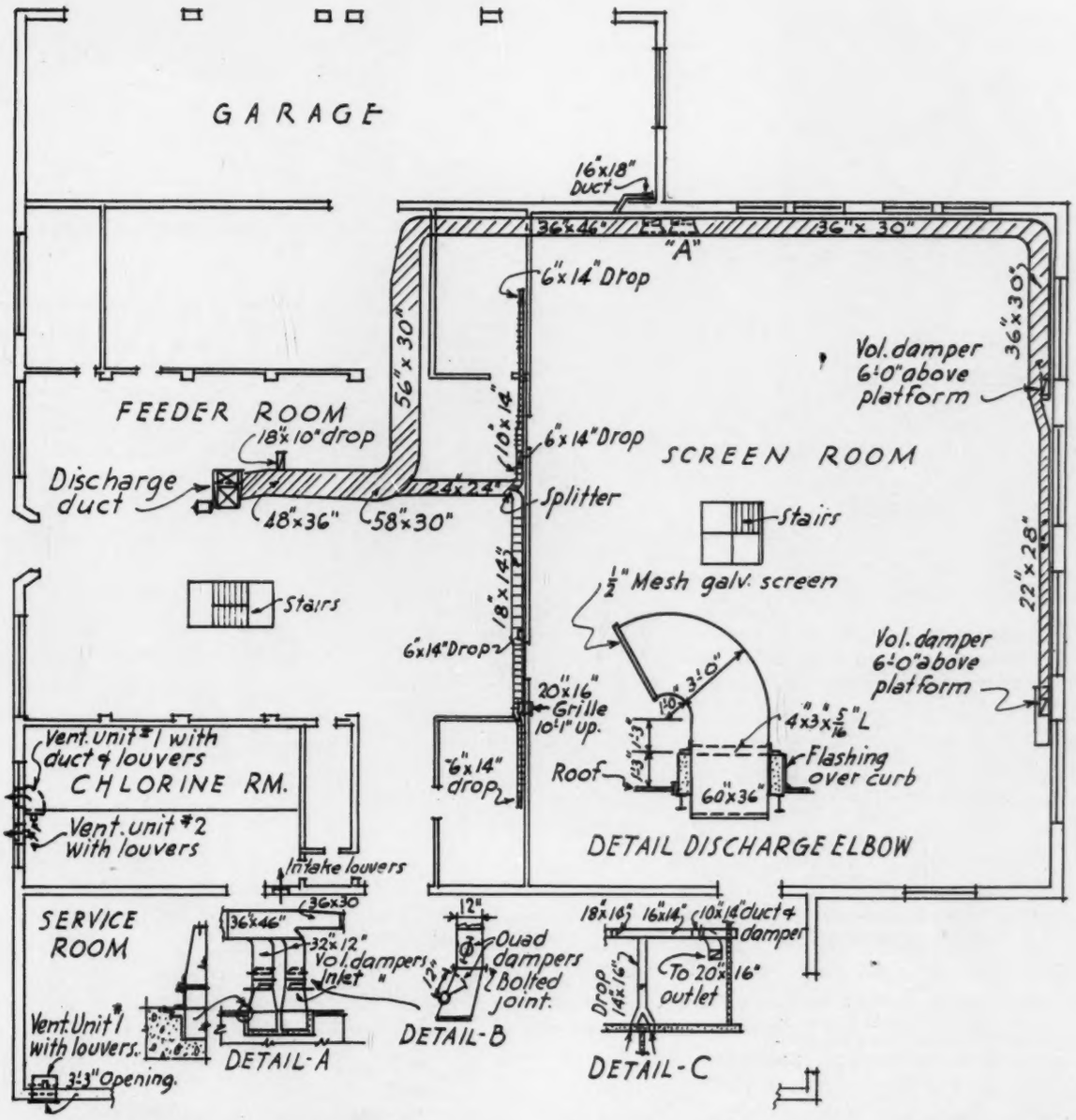
The specifications called for galvanized wrought iron in the following gauges—

Ducts up to 8 inches wide—24 gauge.
Ducts up to 18 inches wide—22 gauge.
Ducts 19 inches to 25 inches wide—20 gauge.
Ducts over 26 inches—18 gauge.

Duct work was constructed with standing seams—1-inch seam on ducts under 18 inches wide; 1½-inch standing seams on ducts over 18 inches wide. Furthermore, all seams were caulked with asbestos cement to insure air tightness and particular care was taken that no fins, ridges, or projections would interfere with air flow.

On narrow ducts each section was made of two pieces. One piece was the top and two sides while the bottom formed the second piece. On wide ducts each section was formed as four pieces—

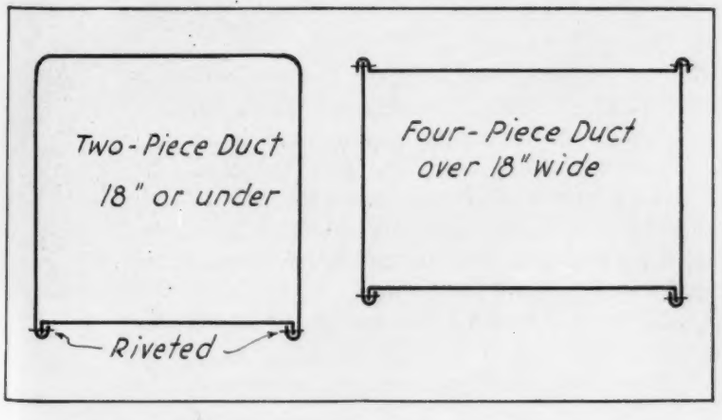
At top of page and above—Two views of wrought iron ducts in screen chamber. Construction follows standard practice. To resist corrosion the sheets are both wrought iron and are galvanized.



Above layout of ducts and details of elbows, branches and intakes. Detail below shows formation of heavy (18 or 20 ga.) and light-gauge 22 or 24 ga. ducts.

top, bottom and two sides. The construction is shown in the sketches.

There was a good reason for this construction. First, all sheets were heavy and stiff. Second, wrought iron sheets should not be bent quite as sharply as other sheets and where possible all sharp bends should be made across the grain of the sheet. Wrought iron is fibrous, since it is composed of a high purity iron base metal plus iron silicate or "slag." The slag content is distributed uniformly throughout the iron in the form of threads or fibres and these fibres extend in the direction of rolling. The resultant structure is somewhat analogous to tough, fibrous wood.



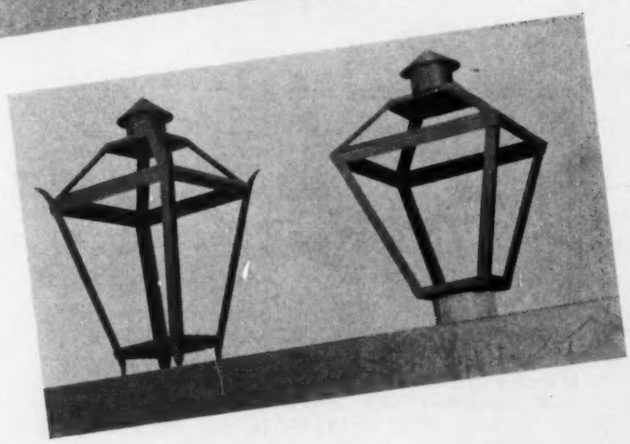
Northwestern put a special long radius nose on the brake and formed all longitudinal seams over this nose to obtain the easy bend required. The nose was a dressed piece of steel. All ducts were formed in 8-foot lengths. The longitudinal seams were riveted as shown.

Most of the duct work in the building is 20-gauge or heavier. In all, some 11,000 pounds of sheets were required despite the limited extent of the ventilation system. A. M. Byers Company genuine wrought iron was used in this installation.

LANTERNS,

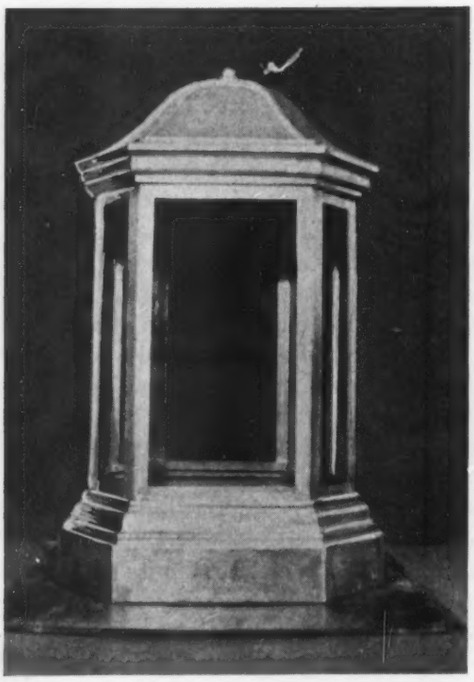
Above — Vieux Carre type lantern, of antiqued copper, designed for post mounting.

Right—Colonial copper hanging lantern (also made in black iron), very popular and made in many sizes.



Far right—Vieux Carre type lanterns made in copper or black iron, painted or natural, of size and type suitable for gardens, porches, etc.

Below—Post lanterns for a city park. About 30 inches in diameter and 4 feet high. Fabricated to match artist's design.



IN THESE days when mass production by machine is the goal and ambition of sheet metal specialty fabricators, the small shop specializing in artistic hand craftsmanship is usually thought of as a road-side "stand" catering to tourists "picking up" mementos. That a hand craftsman shop can be commercially competitive and can find items which combine hand craftsmanship with ready marketability may be surprising.

There is such a shop in New Orleans. Its products are varied and numerous, but each product is painstakingly fabricated by hand, despite the fact that some items have been produced in the hundreds of thousands.

This is the shop of Zansler Brothers, whose owners are Allen F. and Sidney B. Zansler. The products fabricated in the shop are shown in the

Coffee Drippers, Cheese Moulds and Other Specialty Items

Handcrafted in Old New Orleans

photographs. The extent of the brothers' operations is vividly illustrated by the fact that hundreds of thousands of coffee drippers; hundreds of thousands of cheese moulds; thousands of lanterns, of all types, sizes, materials, have been produced since the brothers opened their shop.

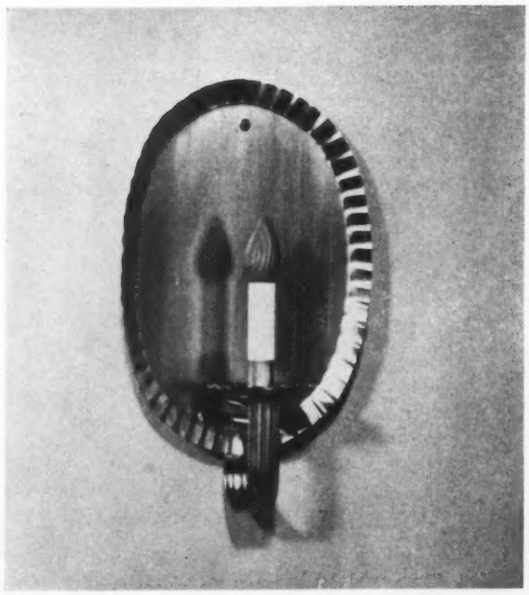
Allen and Sidney Zansler take consummate pride in their craftsmanship—each article must be a perfect specimen of its kind; each item must be as flawless as possible—despite the fact that some items have been produced in the hundreds of thousands. For example, the coffee dripper and cheese mould shown in one photograph. The dripper shown is a two-cup size; is made of tin, soldered; of pieces cut in the foot shear and stamping press, seamed and soldered by hand. It would seem as though any item selling in such large quantities could some way be produced automatically, but Zansler Brothers have gone along year after year making tens of thousands. The drippers are sold to housewives, restaurant operators, through stores and wholesalers wherever drip coffee is favored.

The cheese mould (another hundred thousand item) is a simple little cup, perforated so that the whey in the clabber can seep out while the clabber turns to fresh cream cheese, a Southern dish served with sugar and cream. These moulds are sold to milk and dairy establishments, to housewives—anyone, through jobbers, who makes for use or sale cream cheese. The mould is also tin, cut and seamed and soldered by hand. Perforations are made in a stamping press.

Lanterns—of all sizes, types, materials—though not made and sold in the vast numbers mentioned above, are probably the item for which the firm has become best known. Lanterns 30 inches in diameter and 4 feet high; tiny lanterns for entrance doors, patios, wall ornamentation, have been built in copper, black iron, brass, tin and many special materials. Zansler

Above—Two-cup Creole tin coffee dripper typical of thousands of drippers hand made by Zansler Bros. Alongside is a tin cheese mould. Zansler has made thousands of these, all by hand.

Right—Allen F. Zansler (left) and Sidney Zansler (right) in their handcraft shop. Allen is assembling a bridge box and Sidney a restaurant coffee dripper. Both items in Monel. (Photo by International Nickel Co.)



Copper light sconce which faithfully reproduces the candle brackets of old New Orleans. Everything hand-made.

Brothers have patterns for scores of lantern types. All are hand fabricated and hand assembled—mostly to special order, although some popular items are stocked for immediate sale. The lanterns pictured are popular enough to warrant stocking.

Home owners and business men in New Orleans and the Delta country seem to like lanterns. Gate posts, door-ways, patios, drive-ways, even gardens are lighted by lanterns fastened to walls, placed on posts, suspended from overhead. Depending on surroundings, Zansler lanterns may be shiny brass, lacquered copper, patinad copper, bronze, black iron, tin, or any other material. The simple frame holds the glass firmly, fabrication is flawless, each type is a faithful reproduction of the lanterns of old New Orleans.

While coffee drippers, cheese moulds. lanterns are the day-to-day items which keep the shop busy, it has been natural that other artistic items should be brought to and produced by Zansler Brothers. Two such items are shown. The copper sconce is a faithful reproduction of the old candle and oil bracket lamps of early New Orleans and the South. Electrified with candle flame bulb, the mirrored reflector with its pie crust rim and the artistic bracket has made this fixture a popular item in brass, copper, brushed tin and other materials.

Beautiful Monel sugar bowl composed of pieces each individually hammered out by hand.

The hand hammered Monel sugar bowl shown is considered by the brothers one of their most artistic pieces. Not a production item, but made to special order, the bowl reflects the painstaking beauty of hand craftsmanship.

Zansler Brothers have manufactured hundreds of sinks, mostly to special order, mostly of stainless steel and Monel; also many sizes and types

Scherck (patented) multiple drip coffee maker made of Monel. All pieces formed and assembled by hand. Zansler Bros. make hundreds of these large size drippers for restaurants and hotels.

of cabinet tops in the same materials. These sinks and kitchen cabinet tops have been placed in private homes and institutions of all kinds. Other special items are table tops, steam tables, and all the equipment used in small and large kitchens.

The sheet metal firm of Zansler was opened about fifty years ago by the father of the brothers. All kinds of metal and non metal roofing and general sheet metal work was contracted, but the father soon branched into the production of tin cans, cracker boxes, shrimp cans, oyster cans, in which New Orleans and Southern producers and distributors packed the products for ship-

(*Continued on page* 104)

Rules Relating to the Removal of Dust, Gases and Fumes [Part 3]

This is a reprint of the New York State Department of Labor bulletin from which many other codes are copied or to which other codes refer. Part 1 of the reprinting appeared in October, Part 2 in November. This concludes the bulletin.

Dust Created by Woodworking Machinery

RULE 748. Every woodworking machine shall be connected to an exhaust system, including a separator that will remove the dust created by such machine at its point of origin.

Exception: Woodworking machines used only occasionally, if upon inspection it is shown that the dust is not created in quantities tending to injure the health of the employees.

RULE 749. Sufficient static suction shall be maintained in every branch pipe to produce a difference of level of at least two (2) inches of water between the two sides of a U-shaped test tube.

RULE 750. Cleanout slides or telescopic sections shall be provided in branch pipes adjacent to hoods under circular saws or other machines from which strips or slivers are deposited in branch pipes.

NOTE.—For construction of exhaust systems, see general rules.

RULE 751. Sizes and numbers of branch pipes. The minimum sizes and numbers of exhaust pipes for woodworking machines shall be as shown in the following tables:

Where necessary, the Industrial Commissioner may require larger sizes and/or more pipes.

Self Feed Table Rip Saw

Up to 16" diam.....4½" pipe on bottom.....4" pipe on top
Over 16" diam..... 5" pipe on bottom.....4" pipe on top

Large Self Feed Rip Saws Other Than Table Saws

Wet lumber .....6" pipe on bottom.....5" pipe on top

Swing Saws

Up to 20" diam.....4" pipe.....Over 20" diam.....4½" pipe

All Rip Saws, Table Saws, Mitre Saws and Variety Saws

Up to 16" diam.....4" pipe
Over 16" diam. to 24" diam.....4½" pipe
Over 24" diam.....5" pipe
Variety saw with Dado head.....5" pipe

Gang Rip Saws

Up to 24" diam.....5" pipe on bottom..4" pipe on top
Over 24" diam. to 36" diam.6" pipe on bottom..4½" pipe on top
Over 36" diam. to 48" diam.7" pipe on bottom..5" pipe on top
Over 48" diam.....8" pipe on bottom..5½" pipe on top

Disc Sanders

Up to 12" diam.....4" pipe
Over 12" diam. to 18" diam.....4½" pipe
Over 18" diam. to 26" diam.....5" pipe
Over 26" diam. to 32" diam.....two 4" pipes
Over 32" diam. to 38" diam.....two pipes, one to be 4" and one to be 5"
Over 38" diam. to 48" diam.....one 5" and two 4" pipes

Triple Drum Sanders

Less than 30" long..... 7" pipe
30" to 36" long..... 8" pipe
Over 36" to 42" long..... 9" pipe
Over 42" to 48" long.....10" pipe
Over 48" long.....11" pipe

Single Drum Sanders

Up to 10" diam. and not more than 200 sq. in. of working surface .....4" pipe
Over 10" diam. and not more than 400 sq. in. of working surface .....4½" pipe
Over 400 sq. in. of working surface and not over 700 sq. in.....5" pipe
Over 700 sq. in. of working surface and not over 1400 sq. in.....6" pipe
Over 1400 sq. in. of working surface and not over 2000 sq. in.....7" pipe

NOTE 1.—On drums of more than 2400 square inches of working surface the size of pipe which depends on maximum size of work and the volume of dust created shall be subject to the approval of the Commissioner, but shall not be less than 7 inches.

NOTE 2.—On long drums of small diameter, sizes mentioned above should be divided into two or more pipes equalling in area that of single pipe allowed for working surface.

Horizontal Belt Sanders

Where Bottom Run of Belt is Used

Less than 6" in width 4½" pipe on bottom, with 4" pipe on top
6" to 9" in width.....5" pipe on bottom, with 4" pipe on top
Over 9" to 14" in width 6" pipe on bottom, with 4½" pipe on top
Over 14" in width.....7" pipe on bottom, with 5" pipe on top

Where Top Run of Belt is Used

Where top run of belt is used, pipe on top is not necessary on flat work, but where other work is done telescopic pipe conforming to above dimensions, with hood, shall be installed above the work.

Vertical Belt Sander

With Rear Belt and Both Pulleys Enclosed

Less than 6" in width.....4½" pipe on bottom
6" to 9" in width.....5" pipe on bottom
Over 9" to 14" in width.....6" pipe on bottom
Over 14" in width.....7" pipe on bottom

Swing Arm Sander—Post or Column Sander

One 4" diameter pipe divided into two 3" diameter pipes.

Band Saws

Blade under 2" in width—Two pipes each at least 4" in diameter shall be provided, one with hood on front of saw and the other at a point near the floor on the uprun side of lower wheel. The entire lower wheel shall be enclosed to form a hood.

Band Resaws

	Down Run	Up Run
Blade 2" to 3" in width,	pipe 5" diam.	4" diam. pipe
Blade over 3" to 4" in width,	pipe 6" diam.	5" diam. pipe
Blade over 4" to 6" in width,	pipe 7" diam.	5" diam. pipe
Blade over 6" to 8" in width,	pipe 8" diam.	5" diam. pipe

Jointers

Up to 6" knives, 1 pipe	4" diameter
Over 6" to 12" knives, 1 pipe	4½" diameter
Over 12" to 20" knives, 1 pipe	5" diameter
Over 20" knives, 1 pipe	6" diameter

Single Planers

Up to 20" knives, 1 pipe	5" diameter
Over 20" to 26" knives, 1 pipe	6" diameter
Over 26" to 36" knives, 1 pipe	7" diameter
Over 36" knives, 1 pipe	8" diameter

Double Planers

Up to 20" knives, 5" pipe on top	5" pipe on bottom
Over 20" to 26" knives, 6" pipe on top	5" pipe on bottom
Over 26" to 36" knives, 7" pipe on top	6" pipe on bottom
Over 36" knives, 8" pipe on top	7" pipe on bottom

Moulders, Matchers, Sizers

Size	Top head	Bottom head	Right	Left
Up to 7"	5" pipe	4½" pipe	4" pipe	4" pipe
Over 7" to 12"	6" pipe	5" pipe	4½" pipe	4½" pipe
Over 12" to 18"	7" pipe	6" pipe	5" pipe	5" pipe
Over 18" to 24"	8" pipe	7" pipe	6" pipe	6" pipe
Over 24"	9" pipe	8" pipe	7" to 8" pipe	7" to 8" pipe

Sash Stickers

4" pipe on each head.

Woodshapers and Variety Machines

1 pipe 4½" diam. to 6" diam. for each spindle according to size and character of work.

Tenoner

Top head	Bottom head	Other heads
5" pipe	5" pipe	4½" to 5" pipes

Where saws are used 4" pipe on each saw.

Automatic Lathes	3" pipe to 10" pipe, according to length
Forming Lathes	4" pipe
Chain Mortises	3" pipe
Dowel Machines	4" pipe
Panel Raisers	4" pipe on each head
Dove-Tail and Lock Corner Machines	4" pipe
Pulley Pockets	5" pipe
Pulley Stiles	5" pipe
Glue Jointers	6" pipe
Ploughs	4" pipe
Ralishers	4" pipe
Gainers	4" pipe
Routers	4" pipe
Duplex Moulding Sanders	4" pipe

Hogs

Up to 12" wide	8" pipe
Over 12" wide	12" pipe

Floor Sweeps

6" pipe for fine dust to 8" pipe for coarse material. Mouth at floor 10" x 4" to 12" x 5".

NOTE.—The area of floor sweep pipes need not be included in computing main pipe area.

Dust Created by Granite Working Tools or Machines

RULE 752. Every granite working tool or machine shall be connected to an exhaust system, including a separator, that will remove all dust created by such machines or tools, insofar as it is practicable, at its point of origin.

RULE 753. Chip traps shall be provided and connected to the refuse receptacles.

RULE 754. Sufficient static suction shall be maintained in every branch pipe to produce a difference of level of at least four (4) inches of water between the two sides of a U-shaped test tube.

RULE 755. Stationary pipes shall be constructed of galvanized sheet steel of the following minimum sizes and of the following gauges of metal unless otherwise specified by the Industrial Commissioner:

Size of Pipe	Minimum U. S. Standard Gauge of Metal
5½" to 18"	No. 18
Above 18" to 30"	No. 16
Above 30"	No. 14

Flexible hose may be used between the hood and stationary pipe.

RULE 756. The inside diameter of all pipes shall not be less than 5½". The cross sectional area of the outlet orifice shall be not less than 24 square inches.

Silica Dust Created in Other Industries

RULE 757. In any industry, trade, occupation or process involving the creation of silica dust, there shall be provided means for removing such dust at point of origin, or preventing same from being disseminated in the air breathed by employees, insofar as it is practicable to do so.

Inspectors Needed for War Department

The United States Civil Service Commission is endeavoring to secure inspectors of miscellaneous supplies to fill positions at the Jeffersonville Quartermaster Depot, Jeffersonville, Indiana.

Inspectors are needed in hardware, stoves and ranges, sheet metals and sheet-metal products, bakery and cafeteria equipment, tableware and kitchen utensils, paints, varnishes, shellac, lacquers, etc. The salary for these positions ranges from $1,800 to $2,000 a year, less a retirement deduction of 3½ per cent.

Applications may be filed with the Secretary, Board of U. S. Civil Service Examiners, U. S. Engineer Department at Large and Jeffersonville Quartermaster Depot, Louisville, Kentucky, until further notice.

Applicants must have completed a 4-year high-school course, except that they may substitute additional inspectional or testing experience for this requirement. In addition, they must have had 4 years of experience in the inspection or testing of one or more of the classes of supplies listed above. Each year of college study in appropriate engineering courses may be substituted for each 6 months of this experience.

Further information regarding the examination may be obtained from the Secretary of the Board of U. S. Civil Service Examiners at the post office or customhouse in any city which has a post office of the first- or second-class, or from the United States Civil Service Commission, Washington, D. C.

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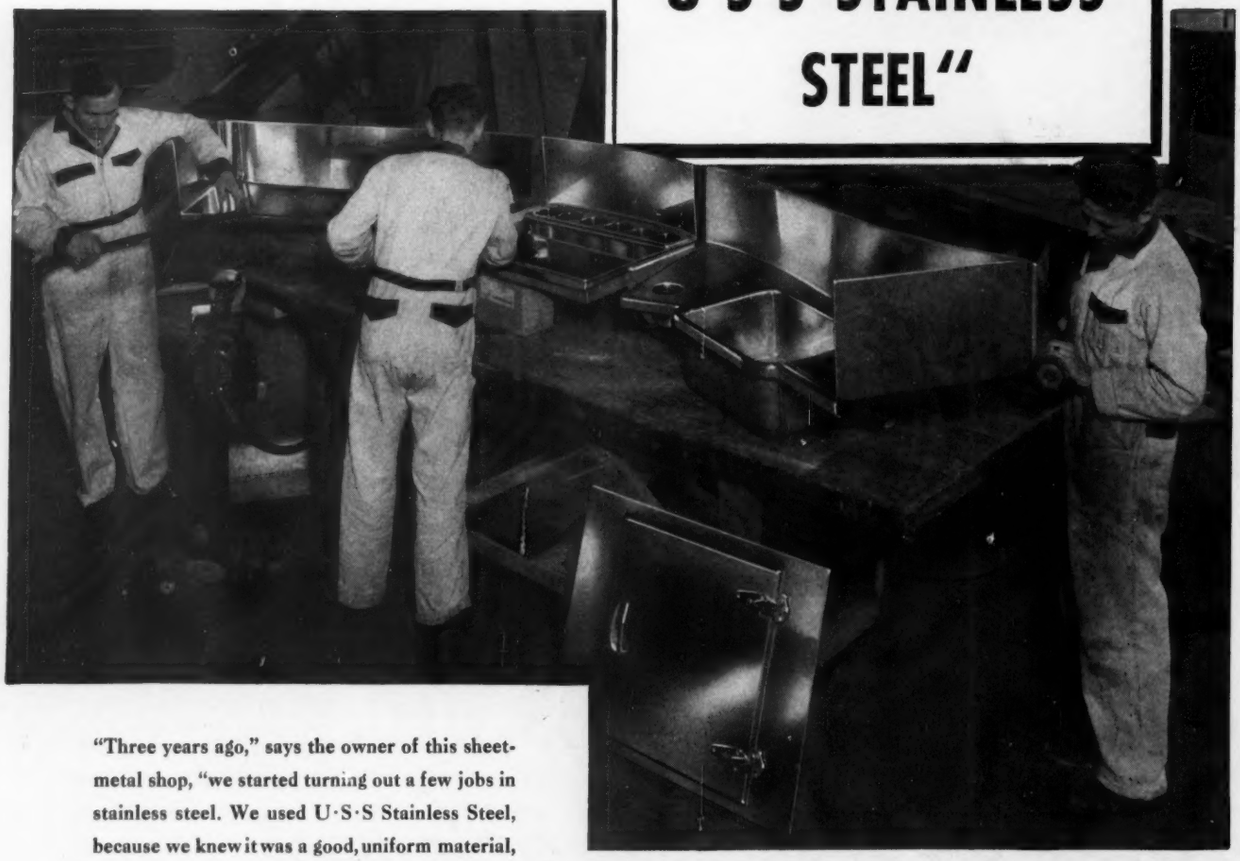

"Three years ago," says the owner of this sheet-metal shop, "we started turning out a few jobs in stainless steel. We used U·S·S Stainless Steel, because we knew it was a good, uniform material, and because the U·S·S specialists were so helpful to us in designing, welding, and finishing.

"I never saw anything catch on so fast. It seems that every stainless job we installed brought us two more orders. Now we do at least 90 per cent of our work in U·S·S Stainless Steel. We're known throughout this territory now as Stainless Specialists. Whenever anybody wants work done in stainless steel, they immediately think of us."

THAT'S the way it has worked out in dozens of sheet-metal shops. They start working in U·S·S Stainless Steel as a sideline, and before they know it, they are specialists in their territory, with more business than they know how to handle.

If you haven't already begun handling stainless sheet work, it will pay you to start now. The opportunities are endless—hotels, restaurants, clubs, stores, hospitals, factories, schools, and private homes—all have places where this bright, easy-to-clean metal is needed. Ask the U·S·S specialist to give you any help you need, or write for data.

U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*

NATIONAL TUBE COMPANY, *Pittsburgh*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Export Company, New York · Scully Steel Products Company, Chicago, *Warehouse Distributors*

USS

UNITED STATES STEEL

BOOKKEEPING—

A Plan of Accounts [Part 3]

By Joseph G. Dingle, C. P. A., Ottawa, Ill.

IN our October article we presented a Chart of Accounts, showing the several accounts necessary for the proper classification of the business activities of the typical Heating and Ventilating shop. In that issue, we discussed the Asset accounts, and in the November issue we discussed the Liabilities and Capital accounts. We have, then, discussed the accounts with "things owned" and "debts owed" to outsiders and to the proprietor.

We now come to that section of the Chart of Accounts which deals with the INCOME ACCOUNTS. We suggest that our readers refer to the October issue and refresh their memory of the Chart of Accounts, believing that such a procedure will aid materially in understanding the continued discussion of these individual accounts. As we stated in the November article, this full discussion is too long to be covered in a single issue of the ARTISAN and we have divided it into its natural classes. Taken as a whole, these several articles will cover the complete accounting procedure.

As will be seen from the Chart of Accounts, also in the following discussion of the separate accounts, we have provided four separate "Sales" accounts, each followed by its own "returns and allowances" account, and its own "cost of sales" account. Thus we provide for a full segregation of the operations of the business in each of the four "sales" departments, arriving at a "gross profit" for each of the several departments.

"Merchandise" Account is Obsolete

Up to the turn of the present century, it was common practice for the small business man to use what was then called a "merchandise" account, to which was charged all purchases of merchandise, or material, which purchases were at wholesale. Then, as the goods were sold, it was the custom to credit this same "merchandise" account with the total of the sales, which were, of course, at the retail price.

The objection to this practice was, first, that it used two different bases for the same goods. To illustrate, assume the purchase of a dozen articles for $9.00 per dozen. These articles would sell at $1.00 each, and when nine had been sold, the account would have received a charge for the $9.00 paid for twelve articles, and a credit of $9.00 for the nine which had been sold, at $1.00 each. Then, the account would be balanced, and yet there were three of the articles on hand unsold. When they had been sold, there would be a credit balance in the account of $3.00. The account would then have to be analyzed to determine the actual transactions, which actually were:

Sales—12 articles at $1.00 each	$12.00
Cost of Goods Sold—12 articles	9.00
Gross Profit	$ 3.00

In order to make the accounts more usable, it was found that by opening a "sales" account, to receive the credits for sales, and using the "merchandise" account to contain only the purchases of merchandise at cost, the two accounts would fill the need for determining the sales volume and the cost of the goods sold. Subsequent developments in the accounting art have separated the sales accounts into such accounts as will best show the activities of the business, along its broad general lines. In this plan of accounts, we have provided several sales accounts, which we shall now discuss in the order of their appearance in the Chart of Accounts.

Relationship of Sales and Overhead

Sales volume is a very important item of information. Whether you realize it or not, you must use an estimated sales volume for the year in arriving at your basis for computing overhead and profit. Let's take rent as an example. Suppose your rent is $100.00 per month, or $1,200.00 per year. If your total year's sales are $1,200.00, your rent will consume the entire proceeds from sales. If sales are $12,000.00 per year, rent consumes only 10% of gross sales; and if sales be $24,000.00, rent consumes only 5% of gross sales.

You must, therefore, watch sales volume from month to month and if the volume is falling below your estimate, you must either get more business or reduce overhead expenses. Don't wait until the year has passed and then wonder why you lost money. Know where you are from day to day. Sales of $24,000.00 per year requires a monthly average of $2,000.00, or a daily average of $66.66.

101—SALES OF MATERIAL—This account, as its name implies, is to receive the credits of sales of material only. There will, of course, be many sales of material coupled with sales of labor. For instance, a furnace job will involve the sale of material and also the sale of labor. You will bill this as a completed job to your customer and, at first thought, you will say that it is unnecessary to separate the sale into its component parts—Material and labor. As the costs for this job come to the office from the shop, they will be segregated as to materials and labor. As you built up your estimate of the cost of this job, for the purpose of making a price to your customer, you first took off the material, then computed the cost of the labor necessary to fabricate the necessary ducts, etc., and to this total you added your overhead and then your profit. For the purpose of here illustrating the several steps, both as to the estimating and to the breaking down the final sale into the two accounts, Sales of Material and Sales of Labor, we shall use figures which are easily applied to our purpose, without regard to their representing an actual sale.

Materials, including furnace, at cost of	$100.00
Labor, fabricating & installing, at cost of	50.00
Total cost of material and labor	$150.00
Overhead—50% of labor	25.00
Total cost	$175.00
Add profit of 15% (approximately)	25.00
Selling price	$200.00

Having sold the job for $200.00, we can now break up our selling price into its several parts, as follows: We sold the job for $200.00 and all of that must be included in the two sales accounts —Material and Labor. Materials, at cost represent two-thirds of the total material and labor cost, while labor cost represents the remaining one-third of the cost. Then two-thirds of the sale price is allocated to the Sales of Material, and one-third of the sale price is allocated to the Sales of Labor. The sale, then will be entered as a Sale of Material for $133.33, and Sale of Labor $66.67. While overhead has been computed as a percentage of the labor cost, it applies both to the sales of labor and the sales of material, and the profit, of course, applies on both types of sales. Let's assume, for the purpose here, that the estimated cost and the actual cost was identical. We can, then, show an operating statement for the transaction as follows:

	Material	Labor	Total
Sales	$133.33	$66.67	$200.00
Cost of Sales	100.00	50.00	150.00
Gross Profit	$ 33.33	$16.67	$ 50.00

Here we have a gross profit on the combined sale of $50.00, and after deducting the overhead, estimated at $25.00. we have a net profit of $25.00. The overhead, being the expenses of the business generally, and being difficult, if not impossible, of allocation to the several sales accounts or departments, should be applied against the total sales only. For purposes of management, however, it is essential to know that the sale price of the material was sufficiently in excess of its cost to carry its share of the overhead of the business and also a measure of profit. The same holds true of the sales of labor. The wages paid to the workmen must be sufficiently increased for purposes of sale to include a proper proportion of the overhead and still leave a profit. To further illustrate this point, let's assume actual cost of labor to have been $60.00 instead of the estimated cost of $50.00, as used in the estimate. Under these conditions, we would have:

	Material	Labor	Total
Sales	$133.33	$66.67	$200.00
Cost of Sales	100.00	60.00	160.00
Gross Profit	$ 33.33	$ 6.67	$ 40.00

At a glance, we can see that we have a gross profit in the sale of material of 25%, which is as originally figured; but in the sale of labor we have only a 10% gross profit—15% short of our estimated profit. As to the total, while we figured on a 25% gross profit in the sale price of $200.00, or $50.00, we have only $40.00 gross profit, which is only 20% on the sale of $200.00. Right away, we can see that the trouble lies with the cost of the labor. Referring to the estimate, we find we figured labor to cost $50.00, and it actually cost $60.00. Perhaps the estimate was in error; or, on the other hand, perhaps the boys got off on the wrong foot in the installation of the job. Either could cause this increase in estimated cost. The fact remains, however, that we cannot charge the customer with that extra cost, and the loss is "on the house." The next estimate, however, should take into consideration this upset, and either the estimated cost of labor should be increased, or a little care used to avoid getting lost on the job, to save that $10.00. It is vitally essential that the business man know where his leaks, or mistakes, are in order that they may be corrected before they break him. The best means

of locating leaks, or errors, is by the use of an adequate set of books, kept up to date, and from which are prepared monthly operating statements for the study and use of the management. After being prepared, they should be used by the management.

102—SALES OF LABOR—Under Sales of Material, we have discussed the matter of the need of separate accounts for the sales of materials and sales of labor, and there illustrated in some detail the operation of these two sales accounts. It is not necessary that we again discuss this question here. Suffice it to say that care must be exercised in the allocation of sales involving both material and labor in order that both accounts may show a true picture. We might add here that in the case of a sale, without a prior estimate or price, the operation of the transaction will be substantially the same as is illustrated above. You would have the actual cost of the material used in the job, also the actual cost of the labor, and in pricing the job, you would, of course, build the price on these two known elements, and the sale price, as a total, would be divided between Sales of Material and Sales of Labor on the same basis as is used in our remarks under Sales of Material, above.

103—SALES OF APPLIANCES—This account, as its name implies, is to contain the sales of appliances, that is, merchandise which is sold in the condition in which it is purchased, with little or no installation charge. Suppose you sell an attic fan, and there is a small installation charge. Suppose, however, that there is a rather complicated installation where you run a series of ducts to make the fan more effective. In this case, there would in all probability be an estimate of the job, and on the completion of the job, you would have the sale of an appliance, the sale of material and the sale of labor—all being equal to the sale price of the job. This same condition would apply to the sale of a furnace, installed. The furnace, as such, might be called a sale of an appliance.

104—SALES OF APPLIANCES, WHOLESALE—Not many of the smaller shops will be making wholesale sales, but for the purpose of presenting the unusual condition surrounding such a sale, we have included this account. Suppose you have the local agency for a certain appliance and some fellow, either in your town or in a neighboring town, wishes to purchase one. You will, perhaps, sell it to him at a price somewhat lower than the usual retail price, yet at a mark-up over your cost. That, for the purpose here, would be a wholesale sale. To include that sale with your regular sales of appliances would serve to bring down the average gross profit on your sales in your retail or contracting departments and you would be put to the time and trouble of investigating all sales in order to determine just what caused such a decrease in the gross profit. Assume that you are selling appliances at a price which will yield you a gross profit of 20% in sales, and you find that your actual gross profit for the month is less. You would, of course, want to know why that condition existed, and on investigation you might find that you sold four appliances, at retail, at $100.00 each, which cost you $80.00 each, and one sold at wholesale for $90.00. You would have:

Sales of Appliances	$490.00
Cost of Sales	400.00
Gross Profit	$ 90.00

By separating the retail sales from the wholesale sales, you would have:

	Retail	Wholesale	Total
Sales	$400.00	$90.00	$490.00
Cost of Sales	320.00	80.00	400.00
Gross Profit	$ 80.00	$10.00	$ 90.00

Your problem is instantly recognizable, and it is just as easy for your bookkeeper to keep these two accounts as it is for her to throw all sales into the one account and then have to analyze it for the purpose of bringing out what would have been apparent at a glance in the two acounts. You can instantly see that in the Retail Sales, you realized your full 20% gross profit, while in the Wholesale Sale, you did not.

We have been discussing the Sales accounts, and now we take up the Returns and Allowances, one for each of the sales accounts. These accounts are provided to contain any returned goods, or any allowances from the billed prices in either or all of the sales accounts. Some think it just as easy to allow the returns and allowances to be shown as reducing the sales account. We, however, prefer to use separate "Returns & Allowances" accounts, for the reason that it is well for the management to know what, if anything, is being returned, and what allowances are being made.

The use of a single account for Sales and Returns and allowances results in the account showing the net sales, while the two accounts produce the net sales, by showing first the gross sales, then as a deduction the returns and allowances. It costs money and time to haul merchandise to a job, then to bring it back, and the careful business man will avoid as much of this unnecessary work as is possible. Without knowing the amount of such returns, it is difficult to control it. Again, it is vitally essential to good management to know

(*Continued on page* 102)

Wage and Hour Law Digest

Note. The Fair Labor Standards Act does not cover all employers. Read paragraphs 1-5 and 35-40 to see whether it applies to you. If doubtful about coverage or compliance, get compliance form AD-85 from the nearest regional office, fill it out and send it to the nearest regional office.

Purpose

THE Fair Labor Standards Act of 1938 (commonly known as the Wage and Hour Law) was enacted by Congress to prevent the use of the channels of interstate commerce to spread and perpetuate labor conditions detrimental to the health, efficiency, and well-being of workers and to wipe out unfair methods of competition based on such labor conditions.

Provisions

Coverage.—The wage and hour provisions of the law apply to workers engaged in interstate commerce or in the production of goods for interstate commerce.

Minimum Wages.—No worker may be paid at a rate less than 30 cents an hour for the 6 years from October 24, 1939, to October 24, 1945; or less than 40 cents an hour thereafter. The minimum wage for any covered industry may be raised by wage order up to 40 cents an hour before 1945.

Maximum Hours.—Each worker must be paid at the rate of at least one and one-half times his regular rate of pay for all hours worked over 40 per week after October 24, 1940.

Child Labor.—Since October 24, 1938, goods produced in establishments, in or about which "oppressive child labor" has been employed, have been barred from interstate commerce.

Records

Employers Must Keep Records.—Clear, accurate, and complete records as required by law are the best protection against employee suits and prolonged inspections.

Penalties

The law provides for a fine up to $10,000, or, in the case of a second conviction, imprisonment up to 6 months, or both. It also permits the worker to collect in court double the back wages due him.

Coverage

1. The wage and hour provisions of the Act apply to each employee engaged in—

(a) Interstate trade, transportation, communication, or finance.

(b) Handling, mining, transporting, in any manner working on, or in any occupation necessary to the production of, goods which move in interstate commerce. [The Act provides certain exemptions. See paragraphs 38-41.]

2. An employee is covered by the Act if even a small percentage of the goods he works on is moved in interstate commerce.

3. Employees within the District of Columbia and the Territories and possessions are dealt with on the same basis as employees working in any of the 48 States.

4. Employees are engaged in the production of goods for interstate commerce where the employer, at the time of production, has reason to believe the goods will be moved in interstate commerce, or will become a part or ingredient of goods (such as buttons on shirts) which will be moved in interstate commerce.

5. The child labor provisions of the Act apply to establishments in the United States, Alaska, Puerto Rico, and Hawaii whose goods are shipped or delivered for shipment in interstate commerce.

Wages

6. The minimum wage rate required by the Act is—30 cents an hour for the 6 years from October 24, 1939, to October 24, 1945.[1] 40 cents an hour thereafter.

7. The Administrator may, by order based upon the recommendation of an industry committee, establish for any industry a minimum wage between 30 and 40 cents an hour or set special rates for Puerto Rico. Industry committees are composed of an equal representation of employers, employees, and the public. Employers should make sure whether or not a wage order has been issued applying to their industries. By August 15, 1940, wage orders had been issued setting minima up to 40 cents an hour for pulp and primary paper, leather, and all major divisions of the textile and garment industries, including shoes, hats, and millinery. A list of wage orders is available.

8. The Act does not require that employees be paid on an hourly basis. Any method of payment (such as piece rates) may be used, provided it satisfies the wage requirements of the Act.

9. In computing wages for the purposes of the Act, the employer may include the reasonable cost of furnishing his employees with board, lodging, or other facilities if they are customarily so supplied. "Reasonable cost" does not include a profit to the employer or to any affiliated person. The cost of furnishing facilities which are primarily for the benefit or convenience of the employer (such as tools of the trade) may not be included in computing wages.

Hours

10. The maximum standard workweek provided by the Act is 40 hours per workweek after October 24, 1940.[1] These are not absolute limitations upon the number of hours an employee may work. The Act merely requires that work above these weekly limits shall be paid for at the rate of at least one and one-half times the employee's regular hourly rate of pay. [See paragraphs 19-24.]

11. A workweek is seven consecutive 24-hour days. It may begin at any time of any day of the week, but no changes in the workweek may be made for the purpose of evading the overtime provisions of the Act. There is no limitation on the number of hours that may be worked in any one day.

12. There may be no "averaging" over two or more workweeks. Time lost for any reason (sickness, etc.) during one workweek may not be made up in any succeeding workweek without payment at overtime rates for all hours worked in the succeeding week over the statutory maximum.

13. Compensation for overtime must be paid in cash and at the time when the employee customarily receives his compensation. Under certain conditions overtime may be compensated for by a "time off" or a "prepayment" plan. Write for regulations governing use of this plan.

Records

14. Employers covered by any provisions of the Act must keep records, though no definite form is required.

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1. *From October 24, 1938, to October 24, 1939, the Act set a minimum wage rate of 25 cents an hour and a standard workweek of 44 hours; from October 24, 1939, to October 24, 1940, the standard workweek was 42 hours.*

SAMPLE PAY-ROLL FORM[2] (NO PARTICULAR FORM IS REQUIRED)

Workweek ending.....Date of payment (f).....

Name (In Full)	Social Security Account No.	Hours Worked								Regular Rate of Pay	Wages					
											Earnings			Deductions		Total Wages Paid
		S	M	T	W	T	F	S	Total Hours		At Regular Rate of Pay for Total Hours Worked	Extra for Overtime	Total Earnings	Federal Old-Age Insurance Taxes	Other (Itemized)	
(a)		(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(g)	(h)	(i)				(e)
1. George Henry Harper....	129-99-4231	...	8	8	8	8	8	8	48	62 cents per hour (60 cents per hour plus bonus).	$29.76	$2.48	$32.24	$0.32	.....	$31.92
2. Martha Jane Wilson.....	154-99-2176	...	8	8	8	8	8	5	45	50 cents per hour ($20 per week of 40 hours).	22.50	1.25	23.75	.24	.....	23.51
3. Henry Miller Hawkins...	356-99-4578	...	8	8	8	8	8	7	47	46 cents per hour ($80 per month on a week of 40 hours).	21.62	1.61	23.23	.23	.....	23.00
4. Neil Connor.....	369-99-7241	...	8	8	10	8	8	8	50	30 cents per hour ($15 per week).	15.00	1.50	16.50	.17	.....	16.33
5. Janet Barber.....	270-99-1107	...	8	8	8	8	8	6	46	31 cents per hour (P. W., plus bonus).	14.26	.93	15.19	.15	.....	15.04

The only requirements are the following:

(a) Records must be kept for at least 4 years either at the place of employment or at an established central record-keeping office.

(b) All such records must be open for inspection and transcription by representatives of the Wage and Hour Division, and they must be in such condition that an inspector can easily obtain the information listed in paragraphs 15 and 16.

15. With regard to each employee, except those listed in paragraph 38 (see also paragraph 27), employers must keep the following information:

(a) Name in full; (b) home address; (c) date of birth if under 19; (d) hours worked each workday and each workweek; (e) total wages paid each workweek; (f) date of payment; and, in addition to the above, when hours over the statutory maximum (see paragraphs 10-13) are worked by the employee: (g) regular hourly rate of pay and basis upon which wages are paid; (h) earnings at regular hourly rate of pay for each workweek; and (i) extra earnings for overtime. With regard to employees listed in paragraph 39 (a), the employer need not keep the information listed in (h) and (i) above.

16. Where the actual cash wage paid is less than the minimum wage required by the Act and the employer is relying upon the furnishing of board, lodging, and other facilities to bring the wage up to the minimum, the records should show the cash wages actually paid and the amount claimed for board, lodging, and other facilities, which can in no case be greater than the cost to the employer.

17. There can be no substitute for an accurate daily record of the number of hours actually worked by each employee. The posting of a notice specifying the regular hours of work and forbidding overtime "without express official authority" does not release an employer from the obligation to keep a record of hours actually worked.

18. Waiting time constitutes time worked and must be recorded as such, whenever an employee is required to be on duty, on the employer's premises, or at a prescribed workplace, or when the time is too short for the employee to spend it for his own purposes.

Regular Hourly Rate of Pay

19. Rules for computing the regular hourly rate of pay are contained in paragraphs 20-24. Each rule is illustrated on the sample pay roll above.[2]

Agreed Hourly Rate

20. The regular hourly rate of pay is the agreed hourly rate plus production bonuses earned that week (if any) averaged over the number of hours worked that week. Illustration:

1. George Henry Harper (see sample pay roll) is paid 60 cents an hour plus a production bonus of 96 cents for the week. For 48 hours' work he earned $29.76 (60×48+96), exclusive of additional compensation for overtime, which gives him an average hourly rate of 62 cents ($29.76÷48). If he had not been paid a production bonus, his regular rate of pay would have been 60 cents.

Weekly or Monthly Wage for Regular Number of Hours

21. The regular hourly rate of pay is the weekly wage, or the monthly wage reduced to a weekly wage, averaged over the regular number of hours per week. Production bonuses earned any week should be included in that week's wage. Illustrations:

2. Martha Jane Wilson is paid $20 for a regular week of 40 hours. Therefore, her regular hourly rate of pay is $20 divided by 40, or 50 cents an hour.

3. Henry Miller Hawkins is paid $80 per month. His regular workweek is 40 hours. Therefore, his regular hourly rate of pay is 12 times $80 ($960 his annual pay) divided by 52 ($18.46 his weekly wage) divided by 40, or 46 cents an hour.

Weekly or Monthly Wage with No Regular Number of Hours

22. Where there is no regular number of hours per week, the regular hourly rate is the weekly wage, or the monthly wage reduced to a weekly wage, divided by the total number of hours actually worked in the week. Illustration:

4. Neil Connor's regular rate of pay is $15 a week, but his weekly number of hours fluctuates from week to week. One week he works 37 hours; the next 46, etc. Therefore, his regular hourly rate of pay changes weekly. In the week under consideration he worked 50 hours. His regular hourly rate in that week was $15 divided by 50, or 30 cents an hour.

Piece Work

23. The regular hourly rate of pay is the piece-work earnings (including production bonuses, if any) divided by the total hours worked each week. Illustration:

5. Janet Barber is a piece worker who is paid a piece rate plus a production bonus. In the week under consideration, she worked 46 hours and earned a wage of $14.26, including the production bonus. Therefore, her regular hourly rate of pay was $14.26 divided by 46, or 31 cents an hour.

24. The regular hourly rate of pay need not include any figure for extra overtime compensation.

25. Earnings at regular hourly rate. Paragraph 15 (h) does not include extra compensation for overtime. See column (h) of the sample pay-roll form.

26. Extra earnings for overtime. The extra pay for overtime illustrated in column (i) of the sample pay roll was computed by multiplying one-half the regular rate of pay [column (g)] by the number of hours over the

2. *Amounts used are based on time and a half after 40 hours a week*

statutory maximum worked by each employee.

27. An employer shall also keep records, giving only name in full, home address, and occupation, for each employee exempt from the wage and hour provisions of the Act under the exemptions listed in paragraphs 38 (a) and (b).

28. Special records must be kept for redcaps, employees engaged in industrial homework, those covered by agreements listed in paragraph 40 (c), and those who are paid more than one minimum rate during the same workweek. Copies of these requirements may be obtained from the Wage and Hour Division.

29. The signature of a worker on a time or pay-roll record will not relieve his employer from responsibility if the record is inaccurate.

30. Employers are reminded of the record requirements of the Social Security Act and of such State compensation or labor laws to which they may be subject. In many cases employers keeping records pursuant to these laws will have to make only minor adjustments to satisfy the requirements of the Fair Labor Standards Act.

Penalties

31. Employees may bring suits themselves or through an agent in any court of competent jurisdiction to recover unpaid minimum wages or unpaid overtime compensation. Employers violating the wage and hour requirements are liable for double the unpaid sums plus court costs and reasonable attorney's fee.

32. The Federal Government may prosecute criminally for violations of the Act, including the discharge of, or discrimination against, any employee who has filed a complaint. Upon conviction the employer may be fined up to $10,000 and, in the case of a second conviction, imprisoned up to 6 months. The Administrator and the Chief of the Children's Bureau may also ask a Federal district court to restrain violations of the Act by injunction.

33. It is unlawful not only to produce goods for interstate commerce in violation of the Act but also to ship, deliver, or sell in interstate commerce goods so produced. This is the "hot goods" provision. Any person found with such "hot goods" in his possession, even though he is not the original producer, may be restrained by injunction from shipping these goods in interstate commerce. He may also be subject to the criminal penalties of the Act if he ships them knowing or having reason to believe that they were produced in violation of the wage and hour provisions of the Act.

34. No provision of the Act shall justify an employer in reducing the wage or increasing the hours of work of any of his employees.

Child Labor

35. The child labor provisions of the Act prohibit the shipment or delivery for shipment in interstate commerce of any goods produced in establishments in or about which "oppressive child labor" has been employed within 30 days prior to removal of the goods. "Oppressive child labor" is defined as—

(a) Employment of childen under 16, except employment of children between 14 and 16 years of age in such nonmining and nonmanufacturing occupations as the Chief of the Children's Bureau determines not to interfere with their schooling, health, or well-being.

(b) Employment of children between 16 and 18 years of age, in occupations found, and by order declared, by the Chief of the Children's Bureau to be particularly hazardous or detrimental to their health or well-being.[3]

36. Employers can protect themselves from unintentionally employing a child under the legal age by having on file a Certificate of Age issued in accordance with regulations of the Children's Bureau showing that the child is above the legal age for employment in the occupation in which he is engaged.

3. *As of September 1, 1940, occupations in or about explosives plants, the occupations of motor-vehicle driver or helper, and all coal mine work except a few surface occupations had been declared hazardous.*

37. The following are exempt from the child labor provisions of the Act: (1) Children employed in agriculture while not legally required to attend school; (2) children employed as actors in motion picture or theatrical productions; (3) children under 16 years of age employed by their parents, or persons standing in place of parents, in occupations other than manufacturing or mining.

Exemptions

Wages and Hours

38. The following are exempt from both the wage and hour provisions of the Act:

(a) Employees engaged in a bona fide executive, administrative, professional, or local retailing capacity, or in the capacity of outside salesman.

(b) Employees engaged in any retail or service establishment, the greater part of whose selling or servicing is in intrastate commerce.

(c) Seamen or agricultural workers; switchboard operators of small telephone exchanges; certain employees engaged in the sea food and fishing industry; employees of airlines, [street, suburban or interurban electric railways, local trolleys or local motorbus carriers],[4] or weekly or semiweekly newspapers with a circulation of less than 3,000, the major part of which is in the county of printing and publication.

(d) Persons employed within the area of production engaged in handling, packing, storing, ginning, compressing, canning, pasteurizing, drying, or preparing in their raw or natural state agricultural commodities for market or making dairy products.

Hours Only

39. The following are exempt from only the hour provisions of the Act:

(a) Employees of railway or motor[4] carriers which are regulated by the Interstate Commerce Commission.

(b) Employees of employers engaged in the first processing of milk into dairy products, in the ginning and compressing of cotton, in the processing of cottonseed, and in the processing of sugar beets, sugar-beet molasses, sugarcane, or maple sap into sugar or sirup (but not the refining of sugar).

Partial Hour Exemptions

40. The following are partially exempt from the maximum hour provisions of the Act:

(a) Employees in industries found by the Administrator to be seasonal. They may work up to 12 hours a day or 56 hours a week without payment of overtime rates, for a period or periods not exceeding a total of 14 workweeks in any 1 year.

(b) Employees of employers engaged in the first processing, canning, or packing of fresh fruits and vegetables; in the first processing, within the area of production, of agricultural commodities during seasonal operations; or in handling, slaughtering, or dressing poultry or livestock. Such employees are exempt from the maximum hour provisions of the Act for a total of not more than 14 workweeks in any 1 year.

(c) Employees working under an agreement, made as a result of collective bargaining by representatives of employees certified as bona fide by National Labor Relations Board. The agreement must provide for an absolute maximum of 1,000 hours' work in 26 weeks or 2,000 hours' work in 52 weeks. In the latter case, there must be a guarantee of a fixed annual wage or continuous employment for either 52 weeks or for 2,000 hours. In either case work over 12 hours a day or 56 hours a week must be paid for at the rate of time and one-half.

Learners, Apprentices, Messengers, Handicapped Workers

41. No learner, apprentice, messenger, or handicapped worker may be employed at less than the minimum wage except under special certificate issued by the Wage and Hour Division in accordance with regulations promulgated by the Administrator.

4. *This exemption does not always apply. For further information consult the Wage and Hour Division.*

The PROBLEM CORNER

Register Air Temperature With Outside Air

American Artisan:

The problem submitted by W. J. K., (October issue), wherein it is specified that 20 per cent of the air is to be taken from outside, presents interesting questions of interpretation, procedure and mathematics.

According to your interpretation, the air required is 306 lbs. from inside and 93 lbs. from outside, making a total of 399 lbs. **But 20 per cent** of 399 is 80, instead of 93 lbs.

Furthermore, in cases of this kind, the heatman seldom, if ever, needs to know the temperature of the mixture. The common-sense procedure would be as follows:

In the absence of specifications to the contrary, assume all air to be measured at the same temperature; commonly 70 degrees.

Then, for the moment, forget about outside air, and make all calculations as if all air were taken from inside. This will not affect pipe sizes, register temperatures, velocities or blower size. But it will require more heat and a larger furnace, which is provided for by the following equation: $1.08 \times 75 \times 1030 = 8343$ Btu. per hour to be added to the heat required of the furnace.

Wherein: 1.08 is the Btu. per hour to raise the temperature of 1 cfm. 1 degree.

75 is temperature of return air.

1030 is the cfm. from outside.

8343 is the hourly Btu. required for the outside air.

However, if for some reason that I cannot think of, the temperature of this mixture is really desired, the following procedure may be followed:

$(460 + 75) \times 4140 = 2{,}204{,}200.$
$(460 - 20) \times 1030 = \quad 453{,}200.$

Total 2,657,400

$$\frac{2{,}657{,}400}{5150} - 460 = 54 \text{ degrees, the temperature of the mixture.}$$

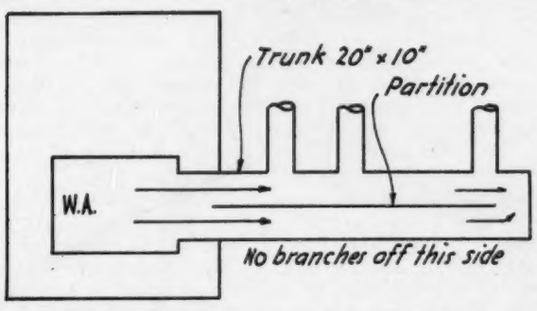
William Scott, Bradfordwoods, Penna.

◆

Rudy "Loop" Variation

American Artisan:

Have you any information on a trunk line designed as shown in the sketch? Has anything like this ever been



used? What are the results? My idea in using this system is to simplify layout and reduce fittings required.

F. C. D., Wisconsin.

Reply by
The Editors

We would say that this is one variation of the so-called Rudy "loop." The Rudy Furnace Co., Dowagiac, Michigan, holds patents on the loop, which may be a duct of one size taken off both sides of the bonnet and passed as a loop around the basement with branch take-offs at the side or top.

A variation of the loop is a single extended plenum with partition, such as you describe. Customarily, branches are taken off of both sides of the partition in order to balance air flow. The theory of the loop is that warm air flows both ways from the bonnet, meeting at some theoretical point in the loop where velocity pressure falls to zero and static pressure increases to 100 percent. Air may be taken off on any part of the loop without transition fittings and depending upon static pressure to insure air flow according to the size of the branch.

We have tested three such systems and have been surprised at the very excellent results obtained. In our tests it has seemingly been impossible to unbalance the system by shutting off dampers or registers and the increase in air delivered at and from registers when other registers are closed does not increase to such an extent that the room served by the open register is overheated very much.

The system has the further advantage of a uniform cross section of duct throughout the loop without reduction in size of pipe and without intricate take-off fittings for the branches. The only drawback is the size of the surface exposed to basement air and the subsequent heat loss at the very low air velocity which exists in some portions of the loop. This, of course, can be overcome by insulation.

If you are interested, we suggest that you address a letter to Mr. Thomas W. Torr, The Rudy Furnace Company, Dowagiac, Michigan. So far as we know, you are not authorized to use this idea unless you are a Rudy dealer or obtain a license from the Rudy Company.

◆

Soldering Chromium Plated Metal

American Artisan:

Will you please tell us what flux to use in soldering chromium plated metal? K. S., Kansas.

Reply by
The Editors

American Nickeloid Company, a manufacturer of chromium plated sheets advises that there is no way of satisfactorily soldering chromium plated material, because the chromium plating is too hard to "take" solder. They suggest that you can solder the base metal if you will remove the chromium plating with muriatic acid. If possible, in assembly seams to be soldered should be placed on the back side of the work where the removal of the chromium plating will not show and will not matter. For soldering base metal under chromium plating, this manufacturer suggests a paste flux which does not spatter.

Association Activities

Illinois

The Illinois Travelers Division of the Illinois Sheet Metal Contractors Association calls attention to their forthcoming convention in the Hotel Jefferson, Peoria, Illinois, January 15th and 16th.

As in former years, the Travelers Division will furnish the annual banquet and entertainment for the dealers.

This year plans for exhibits have been made and a variety of subjects, vital to the industry, will be discussed.

We hope to have the cooperation of our many friends in making this an instructive and enjoyable convention.

E. A. Eichenberger, President.

◆

Indiana Furmets

The Indiana Furmets have met twice with the Directors of the Indiana State association to arrange for the annual convention, and the Indiana Sheet Metal & Warm Air Heating Contractors' Association has accepted the offer of the Indiana Furmets for 100 per cent co-operation, and brought the Indiana convention back to Indianapolis—scheduled for the latter part of January.

Elaborate plans are being made. A general room is being provided for entertainment and refreshments and will be open only between the hours of 5 and 12 p. m. There will be plenty of fun and entertainment, but it will be supplementary to the splendid business program which will be given the prominence and support it merits.

A general fund to cover the cost of the convention is being raised through contributions from the various jobbers and manufacturers. The registration fee is being reduced from $7.50 to $2.00. All money left in the general fund at the close of the Convention will go to the State association to be used in the advancement of the sheet metal and warm air heating industry.

Geo. C. Joslin, Secretary.

◆

Northeast Ohio

The Northeastern Ohio Group of the National Warm Air Heating & Air Conditioning Association held a luncheon meeting on November 8, at the Hotel Hollenden, Cleveland. Vice President H. S. Sharp presided and introduced C. A. Olsen, president of the National Association, who spoke of the program for the Annual Meeting at Detroit and urged all to be present.

W. J. "Bill" Sampson, Jr., Assistant General Sales Manager, Republic Steel Corporation, spoke on "The Outlook for the 1st Quarter, 1941, within the Steel Industry." Mr. Sampson showed that the steel industry had an annual capacity of 65 million tons and that the present operating rate would total 48 million tons. He felt that increases of capacity were unwise, because most of the bottle necks, in the industry were being widened so that a better future was positive, from a finishing angle. He pointed out that the industry had effected a 40 per cent increase in the production of electric furnace steels, including stainless.

Priorities have not as yet been established, because the Defense Commission was trusting the steel producers to handle defense orders in the proper way. Because of the delivery situation in the warm air and sheet metal fields, close cooperation between the steel producers and our industry was essential, so the inventory situation would not plague buyers who had pyramided orders, with the hope of getting quicker deliveries.

Deliveries on the various mill products entering our field would be at about the same rate as the last quarter of 1940, but that some buyers would have to anticipate their wants for some classes of sheet and strip mill products.

Arrangements are being made for the Cleveland Delegation to the National meeting at Detroit to go in a body.

◆

Florida

The Roofing and Sheet Metal Contractors' Association of Florida is composed of union and non-union shops. No discrimination is made between large shops and small shops. You may have representation if you pay the annual dues of $5 to the association.

The officers of the association are co-operating with the State Safety Council to work for the benefit of employers and the employees to reduce accidents and thereby reduce insurance rates. Much has been accomplished.

Contractors are requested to contribute for publication in "The Florida Roofer" personal news items, new methods and new ideas of interest to others.

E. Mack Fillingham, president, from Jacksonville; Bill Palmer, first vice president, from Miami; Frank Tack, second vice-president, from Clearwater; and L. A. Burgess, secretary-treasurer, from West Palm Beach, met in Orlando on Saturday, November 2nd to discuss convention plans and outline policies for the future. The 1941 convention will be held at the Roosevelt Hotel in Jacksonville on April 18 and 19. Ladies are invited and special provisions for their entertainment will be made.

Plans for the convention are being formulated by President E. Mack Fillingham, 1214 Pearl St., Jacksonville, and his local committee. Suggestions may be sent to Mr. Fillingham, or to your secretary-treasurer at 915 N. Poinsettia Avenue, West Palm Beach. Members are requested to pass the word along and to talk up the convention.

In the design for the heading of The Florida Roofer for November 15 recognition is given to both branches of work done by members of the association.

L. A. Burgess, Secretary-Treasurer.

◆

Chicago

The Furnace-Air Conditioning Sheet Metal Institute met on November 14 at Rhineland Hall, Southport and Belmont Avenues, and discussed many important matters. This was an open meeting for members and friends.

Ed. Carter of Snips reviewed the two new rulings on the application of the Illinois State Sales Tax. These rulings change the Sales Tax picture completely and may result in a real saving. Mr. Carter also gave a general report on the change in the wages and hours act which became effective since our last meeting. The new measure calls for a 40-hour week and time a half for overtime. A general discussion followed these reports.

The Institute Educational meetings, which take place every other month, are going over with a bang. At the request of several of those present at the discussion on stokers at our last meeting, a brief resume of the talk by A. C. Schroeder before this group has been reprinted. This reprint is entitled "The Stoker Business as it Effects the Furnace and Sheet Metal Contractor," and copies are available.

Louis E. Drehobl, President.

Association Activities . .

N. A. C. A. Annual

The 1941 convention of the National Air Conditioning Association will be held at the Blackstone Hotel in Chicago on January 13, 14 and 15. The announcement was made by President Jesse W. Page, Jr., at the close of a special meeting held on November 2 at the association's headquarters in the Daily News Building at 220 East 42nd Street, New York City. Tentative plans for the convention were laid down and measures for immediate expansion of the association's membership and general program were discussed at the session.

Mr. Page also announced the retention, subject to the convention's approval, of Arthur F. Callahan, of New York, as executive secretary of the N.A.C.A. "Mr. Callahan," he said, "brings to the management of our association's affairs a decade of experience in the direction of trade organizations in the air conditioning and refrigeration fields, in which he has specialized."

The N.A.C.A. president said he had also appointed A. C. Buensod, of New York, as temporary treasurer to fill the unexpired term of John H. Keller, Detroit, who has resigned. Mr. Callahan will act as assistant treasurer in conjunction with his duties as executive secretary.

It was learned that, in addition to the drive for members, ways and means of providing an enlarged budget to carry out the expanding program of the association were studied at the November 2 session.

Important agenda now being prepared for consideration at the convention include revision of the association's By-Laws which has been undertaken, Mr. Page said, in the light of experience gained since the organization's first convention last January.

Officers of the National Air Conditioning Association are: President, Jesse W. Page, Jr., of Page-Williamson, Inc., Charlotte, N. C.; vice-president, J. N. Sprekelmeyer, General Engineering Corporation, Fort Worth, Texas; treasurer, A. C. Buensod, Buensod-Stacey Air Conditioning, Inc., New York City.

These officers and the following members constitute the Board of Directors: John H. Keller, Mechanical Heat & Cold, Inc., Detroit, Michigan; E. R. Cooney, Cooney Refrigeration Company, Inc., Buffalo, New York; Alfred Epstein, Independent Refrigeration Company, Los Angeles, California; M. S. Lebair, York Ice Machinery Corporation, Philadelphia, Pennsylvania, and S. J. Shure, Natkin and Company, St. Louis, Missouri.

◆

Stoker Manufacturers Meet

A decision to combine the best technical and merchandising talent in the membership of the Stoker Manufacturers' Association in a solidified effort to establish a sound and effective cooperative sales promotional and advertising campaign in the new home building field, was reached at the 1940 fall meeting of the Association held at the Stevens Hotel in Chicago on November 15. This, together with announcements of a concerted drive on the part of the Association's individual members to put into effect practical and effective winter sales plans for leveling out the stoker sales curve, constituted the major considerations and discussions at the annual fall conference of the country's leading stoker executives.

The Advertising and Public Relations Committee of the Association was instructed to prepare a definite program of advertising for submission to the membership of the Association at a special meeting to be held in Chicago about the middle of January.

"The problem of automatic coal heat in new homes, together with the growing seriousness of the extreme sales peaks and low valleys, with precipitous declines in sales in the winter months," Frank Hoke, president of the Association said, "constitutes two problems that will have our very earnest study and attention, and we are convinced that our Association will soon take the necessary steps in cooperative effort that will materially strengthen our position in these respects."

A meeting of the Engineering and Research Committee was held during the day and it was decided to undertake a survey of research work on stokers with a bibliography to be published when this survey is completed.

A luncheon meeting, attended by over 50 members and guests, heard Phil S. Hanna, editor of the Chicago Journal of Commerce, speak on interpretations of the recent national election results. Harold J. Spear, assistant sales manager, Koppers Coal Company, Pittsburgh, Pa., and Walter Knox, research engineer for the same company, at Kearny, N. J., spoke briefly concerning the research work on stokers and stoker coals being conducted by that company at its Kearny, N. J., research laboratory. Then the new color film portraying some of the results of Koppers research work was shown to the group. This film showed, in the main, the different effects of low, medium and high draft, on stoker fuel beds over different periods of time and at different feeding intervals.

◆

Oil Burner Institute Exhibition

Space reservations can now be made for Oil Burner Institute's National Oil Burner Progress Exhibition to be held at the Commercial Museum, Philadelphia, March 17 through 22 next. In announcing the general opening of space, C. F. Curtin, Secretary of the Institute, urged manufacturers of oil burners, manufacturers of oil burning accessory equipment, including air-conditioning, fuel oil companies and other eligible exhibitors to engage sufficient booth space now by communicating with him at 30 Rockefeller Plaza.

"Complete details of the exhibition, containing also a floor plan with the booth spaces, are being mailed to the entire industry and allied industries," Mr. Curtin said. "Our exhibition, which will show oil burner heating, cooking, power and air-conditioning equipment, will signalize and feature the progress made by the oil burner industry in its more than a score of years of existence.

"Oil Burner Institute extends to the oil burner industry and allied industries an invitation to exhibit and to attend the Annual Convention of Oil Burner Institute to be held in conjunction with the exhibition. Exhibitors taking two booths are entitled to a 5 per cent discount, and those taking three booths or more, to a 10 per cent discount. The exhibition will be open to the public free of charge.

The Benjamin Franklin, Chestnut at Ninth, will be official hotel headquarters of Oil Burner Institute during Exhibition and Convention Week.

◆

Memphis, Tenn.

Funeral service for Henry Nohsey, 73, eminent sheet metal contractor, who died at his home, 1841 Galloway, Memphis, Tennessee, on November 13 was held November 14 at National Funeral Home. Born at Grayville, Ill., he came to Memphis in 1889 and was in the sheet metal business continuously for more than half a century and until his death. With the late Hugh Schwab, he founded Nohsey and Schwab in 1898, which was continued as the Nohsey Steel Metal Works, on Mulberry St near Linden, after Mr. Schwab's death two years ago. The firm did a large line of contract work and had an elaborate shop. It did installations on Sheehan Pumping Station and numerous public and private structures in Memphis territory. He was preparing sheet metal for Tennessee Powder Company at Millington when he became ill. Mr. Nohsey learned his trade at his father's shop and his youth was spent at Rockport, Ind. He took much pleasure in sport and was a member of Five Lakes Outing Club. He was a Shriner. His wife—the former Miss Kate Krieger, a son—J. H. Nohsey, a daughter, a brother and three sisters survive.

(*Continued on page* 88)

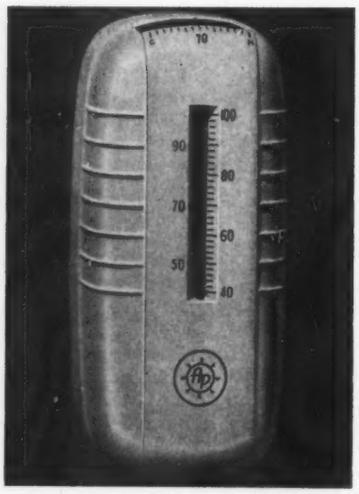
New Products

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 86 and mail to us.

● Indicates product not listed in 1940 Directory.
△ Indicates manufacturer not listed in 1940 Directory.

239—88-S Thermostat

Automatic Products Company, 2450 N. 32nd St., Milwaukee, announces the Series 88-S thermostat, embodying a new type of "floating mounting." This mounting is accomplished by means of a 3-point arrangement which prevents the base from warping. A fibre wiring board fits against the wall, and acts as an insulator for the wiring.

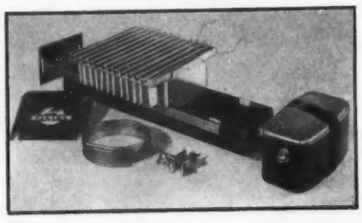


The die-cast case is finished in soft cream, and fits over the thermostat base and mounts flush against the wall. A new Alnico magnet is used on the 88-S. The temperature control is mounted on top of the thermostat for convenience in the chair-level installation. Temperature range is calibrated in units of 2 from 55 to 85 degrees.

◆

240—Plastic Float Tank

Viking Air Conditioning Corporation, 9500 Richmond Ave., S. E., Cleveland, has developed a new plas-

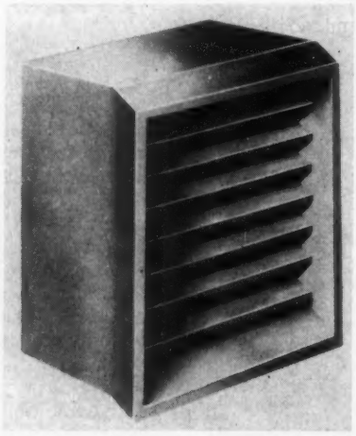


tic float tank for use with two-unit humidifiers.

Cello-Sponge evaporators are of a synthetic sponge material — light weight, non-breakable and absorbent.

●241—Ventilating Brick

Majestic Company, Huntington, Indiana, announces a new Vent-Brick to fill the demand for a large ventilating device for use in foundations



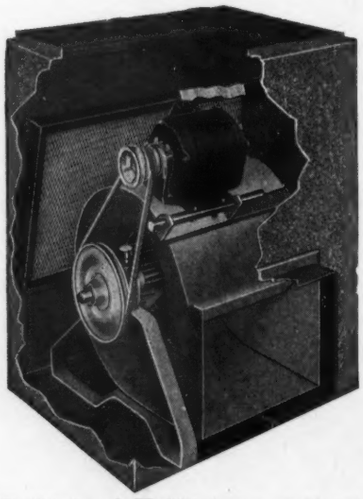
and other inclosed "dead-space" areas, for allowing a certain amount of light plus ventilation—the Ventilatro.

The No. 488 Vent-Brick is cast in a solid unit of semi-steel. It is 8x8x4½ inches, one brick wide and four bricks high. Back of the louvres is a screen.

◆

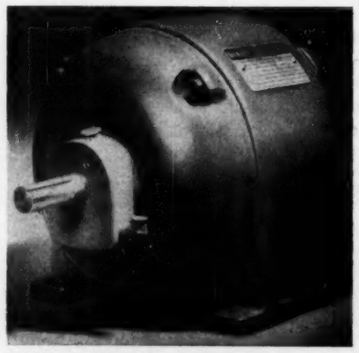
242—Rex Air-Pak

Air Controls, Inc., 1933 West 114th St., Cleveland, announces Model JR-90-6 Rex Air-Pak—similar to the



JR-100-4 and JR-120-4, except that it has a 9-inch blower.

The JR-90 was designed for small homes along with a gravity furnace.



243—Tri-Clad Motor

General Electric Company, 1 River Road, Schenectady, N. Y., announces an entire line of completely new polyphase induction motors in integral horsepower sizes, to conform with new industrial trends, processes and practices—the Tri-Clad motor.

The new Tri-Clad polyphase induction motor has three principal features—better mechanical protection through the use of a cast-iron box-type frame, better electrical protection made possible by Formex (a new type magnet wire), and better protection against operating wear through a new design of sleeve bearings.

◆

△244—AC Welders

Commonwealth Electric Welder Mfg. Co., 3200-F West Oxford St., Philadelphia, is introducing a new line of AC electric welders. These welders are single phase, 60 cycle, and

can be used on one phase of a two or three phase supply line.

All coils are wound with double spun pure fibre glass insulated magnet wire. Every Commonwealth transformer is completely dehydrated under high temperature.

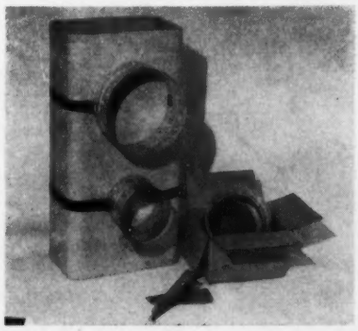
New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 86.

△245—Strap-on Thimble

The Wilson Building Materials Company, 2716 Eugenie Lane, Cincinnati, Ohio, offers an adjustable furnace thimble, strapped in position on the flue lining before the foundation is built.

The new Wilson thimble is adjusted to the proper diameter, held firmly in position on the flue lining with metal



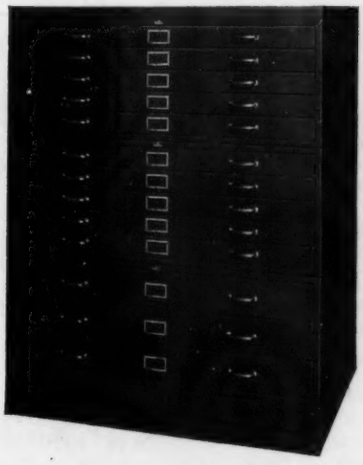
bands, and tightened with a small wedge. The foundation is poured or laid around the metal thimble and the job is complete. The thimble being on the lining, forms a perfect gauge to cut the thimble hole in the lining.

The thimbles are made in two sizes —one adjustable from four to six inches inclusive—the other from seven to ten inches inclusive. They project four inches, or two of these thimbles can be butted together to give an eight inch breadth.

◆

△246—Blue-Print Cabinet

All-Steel-Equip Company, Inc., Aurora, Illinois, announces a new blueprint cabinet with drawers that glide



quietly like cradle-suspension letter files. 3-drawer and 5-drawer unit construction, made in four sizes, gives flexibility to meet filing requirements of drafting rooms.

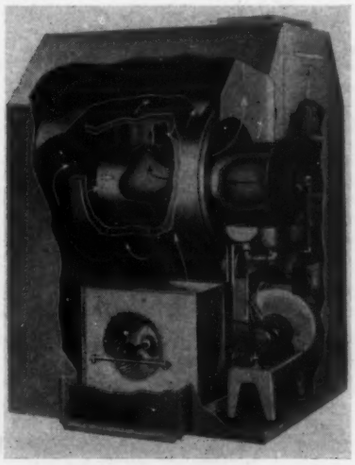
△247—Underwater Paint

Paint-Point Corp., 275 Passaic St., Newark, N. J., offers a new processed paint for painting below ground surfaces, basement brick, concrete, cinder block walls, tunnels, swimming pools, water tanks, conduits and any other surface that condenses water, without the necessity of drying the surface.

◆

248—Model 90 Norge

Norge Heating & Conditioning Division, Borg-Warner Corporation, 670 E. Woodbridge St., Detroit, announces another new winter air-conditioner—Model 90, for utility room or basement.



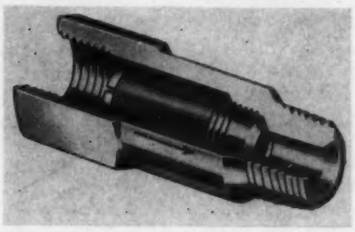
Model 90 is an oil-fired forced warm air conditioner, fully automatic, with intermittent electric ignition, adjustable humidification, and improved air filters—featuring the Norge pull thru draft stabilizer and a 17-foot spiral shaped economizer.

Rated capacity is 90,000 Btu at the bonnet. Finish is brown auto lacquer. Cabinet stands 53¼ in. high and occupies a floor space 33 by 49 inches.

◆

●249—Spray Nozzle Strainer

Spraying Systems Co., 4021F W. Lake St., Chicago, has just placed on the market a strainer to be used in connection with their spray nozzles



when foreign matter interferes with efficient operation. It is equipped with ¼-in. pipe connection for inlet and outlet.

●250—Draft Control

Conco Engineering Works, Mendota, Illinois, has placed on the market a new motorized draft control designed to retard the draft during the unit's "off" period, and regulates the draft during the "on" period.

The Field motorized draft control consists of a regular type "M" Field barometric draft control, equipped with an approved torque motor wired direct to the burner control box, and is offered in 9, 10, 12, 15, 18 and 20-in. sizes.

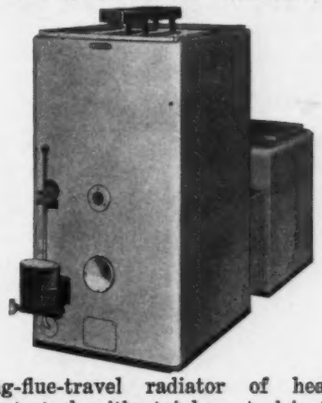
Construction consists of a housing of heavy material, equipped with side wings, through which the gate moves closely. The gate is mounted off-center to develop a greater effective area on which the draft can operate.

◆

251—3-Way Oil Heat

Perfection Stove Company, 7609 Platt Ave., Cleveland, offers a new oil burning furnace for the low-cost homes with three options—manual operation, automatic gravity, and complete winter air conditioning.

The Series 80 Superfex has a built-in burner, combustion chamber and



long-flue-travel radiator of heavy sheet steel, with stainless steel in the combustion chamber top. The casings have double walls.

Where first installed for manual operation, the installation later can be made automatic by the addition of a thermostat, electrically operated oil valve, limit control and humidifier. Capacity is 53,000 Btu at the bonnet.

Complete winter air conditioning includes adding a blower and air filter unit to the furnace. The electric blower motor operates also a small blower to provide additional air for combustion, and boosting the heating capacity to 70,000 Btu.

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Stoker Course at Massachusetts University

John P. McGrail, Supervisor of Education, Massachusetts Department of Education, Division of University Extension, announces that this Division will offer a comprehensive course in Domestic Stoker Engineering to start January 16 and continue each Thursday night for eight weeks. Class meets at the Massachusetts Institute of Technology.

The course will be conducted by Allen H. Bearse, Jr., of Waltham, New England manager of Anthracite Industries, Inc., on a lecture-discussion basis with a question period at the end of each meeting. The charge for the present course is $5 plus $1 for text material.

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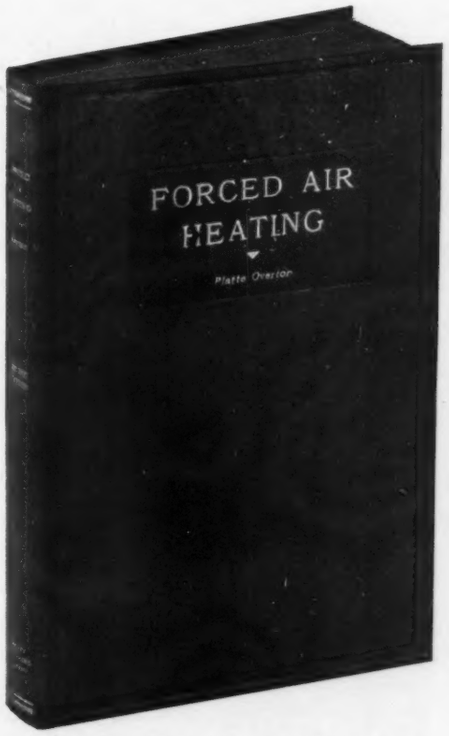
FORCED AIR HEATING'S primary object is to show you how your designing problems can be speeded up and simplified. The methods this book recommends are a safe balance between the theoretically perfect procedures which require an excessive amount of time, and the haphazard methods which so often result in costly omissions or mistakes. They are procedures which have been proved completely reliable, as well as important time-savers, through successful application to many hundreds of forced air jobs of all sizes and complications.

WRITTEN IN PLAIN LANGUAGE

Every thought and device to make this second edition a practical, every-day guide to better and more rapid procedure in forced air heating design work has been included in it. It is written in the plainest possible language, and filled with illustrations and concrete examples that make each recommended procedure easy to understand and to apply.

Begin now to improve and to speed up your designing methods—equip yourself to do more and better forced air work at a better profit—by sending $1.00 today to the address below for a copy of FORCED AIR HEATING.



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—Temperature Drop in Ducts
—Mechanical Code for Forced Air Heating
—Sizing Ducts by Friction Chart Method
—Sizing Extra Long Runs
—Pressure Losses
—Velocities
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—Branch Take Offs
—Volume Dampers
—Bonnets and Plenums
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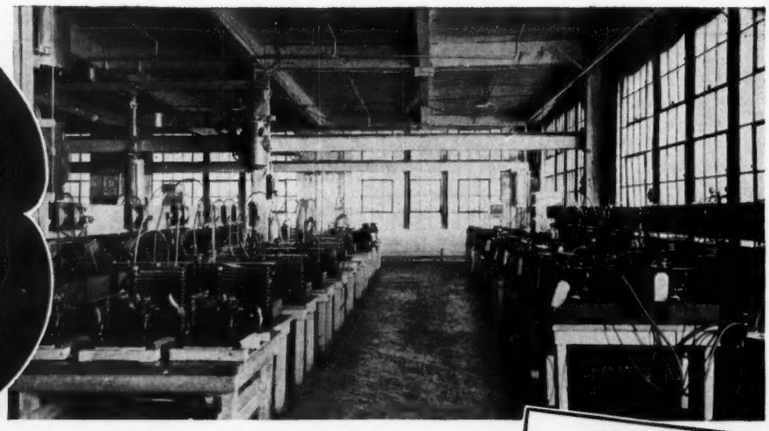
Tests that Assure You The Dependable, Low Cost Performance of

CURTIS Condensing Units



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● In addition to a test for volumetric efficiency, every Curtis compressor is given an individual run-in test; first, operating as a compressor, and secondly as a condensing unit. Suction valves are tested by running the compressor against a maintained vacuum for a definite period of time.

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Above — 1½ h.p. Air-Cooled Condensing Unit
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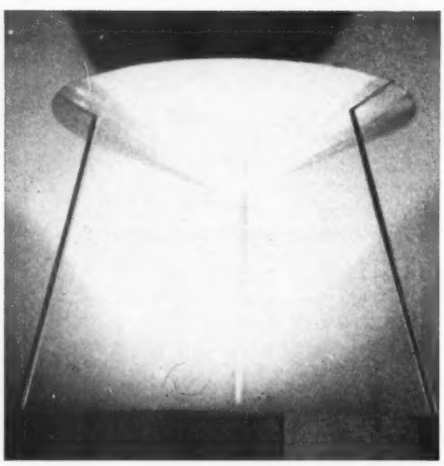


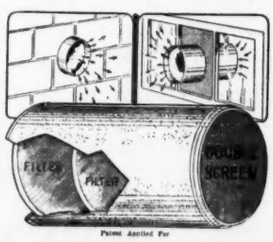
Chandler "Radiant Heat" Baffle

IN every home equipped with an oil burner, there is a ready market for this new, efficient Chandler "Radiant Heat" Baffle. Scientifically designed for added heating effectiveness at lower cost, this dependable baffle makes it easy for you to increase the profits of your business.

Constructed of special High Temperature Steel Alloy, the "Radiant Heat" Baffle deflects hot burned gases to the sides of the furnace, thus automatically extracting more heat from the fuel. Because this baffle heats up so quickly, it makes a second ignition point for the unburned fuel and reignites it for better combustion. Fuel savings range from 10 to 30%.

Adjustable legs afford easy installation in boilers or furnaces fired by pressure or gun type oil burners. Begin now to "cash in" on the fuel-saving Chandler "Radiant Heat" Baffle.

Health Master VENT-O-STAT



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Another Profitable Fuel Saver

The need for an automatic draftless ventilator for more efficient home heating has been met successfully with the trouble-free Chandler HealthMaster Vent-O-Stat. It assures an adequate supply of fresh, filtered air to help produce a clean burning fire with any fuel. The Vent-O-Stat is installed through basement wall or window . . . there are no moving parts . . . filters are inexpensive and easily replaced. Reap extra profits from easy sales.

Write today for Free literature and prices on this line of Heating Specialties.

CHANDLER COMPANY CEDAR RAPIDS, IOWA

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 86.

271—Automatic Heating Accessories

Robert Barclay, Inc., 122 North Peoria St., Chicago, wholesale distributors of automatic heating accessories, is distributing Catalog No. 113—Winter 1940-1941. There are 64 pages and cover, completely indexed.

◆

272—Building Necessities

The Majestic Company, Huntington, Indiana, is distributing a 32-page catalog of building necessities, including incinerators, kitchen ventilating fans, ventilating brick, fireplace circulators, and heating equipment.

◆

273—Time Switches

General Electric Company, 1 River Road, Schenectady, N. Y., is distributing publication GEA-2963B—Time Switches for the automatic control of exhaust fans, pumps, blowers, mixing valves, filter cleaning, sign flashing and many other industrial processes.

◆

274—Controlled Heat Furnaces

Hoffman Specialty Co., Research Laboratories, Stamford, Conn., is distributing Report 10—Problem 37, covering the Hoffman controlled heat furnaces, Models HB-75 and HU-70. Model HB-75 is a basement unit, while Model HU-70 is a utility room unit.

◆

275—Portable Electric Tools

Skilsaw, Inc., 5033 Elston Ave., Chicago, announces Catalog No. 42, illustrating and describing the complete line of Skilsaw portable electric tools. Practicability of all tools and their construction points are shown in working pictures and in detailed specifications for each tool.

◆

276—Heatwave Furnaces

Stephens Manufacturing Company, 2507 East Fifteenth St., Tulsa, Oklahoma, is distributing fourteen pages in a binder covering Heatwave furnaces—closet or utility type self-contained forced air units; Stephens All-Purpose units for year around; Heatwave attic units for cooling and heating; and Heatwave floor furnaces.

◆

277—Whitney-Jensen Catalog No. 14

Whitney Metal Tool Co., 99 Forbes St., Rockford, Illinois, announces their new No. 14 Whitney-Jensen catalog, effective September 1, 1940, which supercedes all previous catalogs as there have been a number of price changes throughout. Also shown are a number of machines and tools not in previous catalogs.

◆

278—Architects and Builders Manual

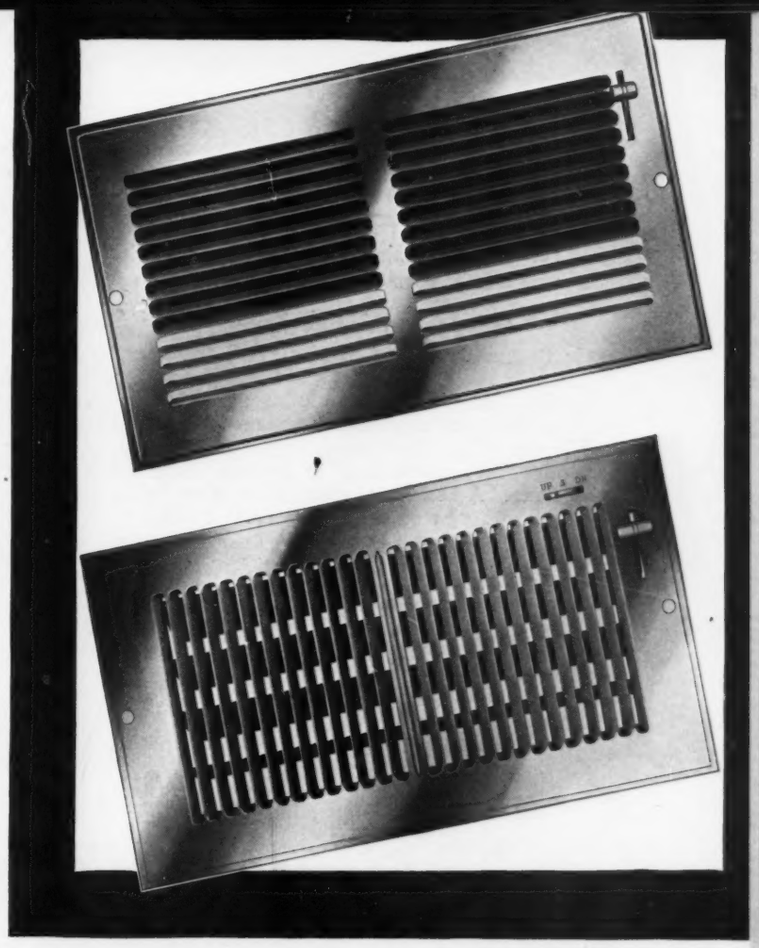
May Oil Burner Corporation, Baltimore, Maryland, has issued a new booklet—"All Lines Point to Quiet MAY"—designed specifically for mechanical and technical men—architects, builders, draftsmen, etc.

The booklet covers automatic oil burners; heating units; air conditioning units and Heat-an-Aire conditioners. All sizes, ratings, dimensions, capacities, and engineering features on the complete line are shown.

◆

279—Airotor Blower Wheels Bulletin 9940

The Torrington Manufacturing Co., Inc., Torrington, Conn., is distributing Bulletin No. 9940 covering their Airotor blower wheels—16 pages, with illustrations, housing data and performance characteristics for each size. Performance curves indicate horsepower and air delivery at various speeds and static pressures. Two additions to the Airotor line are described in this Bulletin—the 9 in. single width, single inlet, Airotor wheel, and the 10½ in. double width, double inlet, spider end plate, Airotor wheel.



PRICE + FLEXIBILITY

THE ANSWER IS Pliavane

Tuttle & Bailey's easily adjustable Pliavane register is the logical answer to the need for a flexible register of quality construction and modern appearance that will keep costs way down. The face vanes are set in a moment's time to deflect the air stream at the desired angle by means of a small tool provided with each register. Here is an outlet, precision built by Tuttle & Bailey, that gives you the opportunity to quote on every job no matter how keen the competition may be.

SINGLE VALVE OR ADJUSTIBLADE TYPES

The Pliavane is made not only in the conventional single-valve style which allows for up and down deflection of the air, but in the adjustiblade construction which gives you a unit providing for up and down and sideways deflection in the same outlet. In cost the Adjustiblade Pliavane is actually less than you may have been used to paying for a single-valve register without an adjustable feature.

INVESTIGATE THE PLIAVANE!

T & B TUTTLE & BAILEY, Inc.
NEW BRITAIN, CONN.
NEW YORK CHICAGO PHILADELPHIA

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on this page.

280—Rex Air-Pak Blower-Filter

Air Controls, Inc., 1933 West 114th St., Cleveland, is distributing three new catalog bulletins recently published describing their Rex Air-Pak blower-filter units. These bulletins point out a number of changes in the equipment.

Cabinets and several cases have been reduced in size and have been redesigned to present more attractive appearance. A hammered style, silver grey finish, is now standard, although other colors are available.

◆

281—Why Not Nibble It!

Andrew C. Campbell Division, American Chain & Cable Company, Inc., 929 Connecticut Avenue, Bridgeport, Conn., is distributing "Why Not Nibble It!"—an 8-page catalog presenting the complete Campbell nibbling machine story in quick, concise and graphic manner.

The new, wide range, No. 250 Nibbler is pictured and described. Specifications for all seven Campbell nibblers are included.

◆

282—Gas-Saver Air Conditioner

Perfection Stove Company, Inc., 7609 Platt Avenue, Cleveland, is distributing a new folder entitled "Superfex 'Gas Saver' 24-hour Air Conditioning Gas Burning Furnace" for small homes. The new Superfex regulates house temperature by using a pilot, low and high fire cycle. During the pilot stage and the second, low, coasting fire stage, the blower is operating on low speed; but during the third stage, high or booster fire, the blower changes to high speed. Specifications are included.

283—Tilco-Fin Tubing

Tilco-Fin Incorporated, 58 Second Avenue, Brooklyn, is distributing a 4-page circular illustrating and describing Tilco-Fin tubing for both gravity and forced circulation—heating and cooling.

◆

284—Oil Air Conditioner

The Excelsior Steel Furnace Company, 118 S. Clinton St., Chicago, is distributing a 6-page circular illustrating and describing the Excelsior Unique oil-burning air conditioner. Construction, special features and specifications are included.

◆

285—Resistance-Welder Control

General Electric Company, 1 River Road, Schenectady, N. Y. is distributing publication GEA-2791B—Thyratron Resistance-Welder Control for accurate and reproductible spot and projection welding—8 pages with table of KVA ratings of Ignitron tubes.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

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Are you Manufacturer———Jobber———Dealer———

NEW MODERN DESIGN ★

Easy Foot Operation with Niagara Gap Shears

It is smart buying to choose a gap shear. 18 inch gap lets you cut sheets longer than cutting length of shear! New modern design provides easy foot operation and convenient handling of sheets. Rigid housings maintain alignment of working parts and accuracy of knife travel. Self-locking eccentrics make it possible to let go of the holddown while stepping on the treadle.

Complete with gages and genuine Niagara alloy steel knives.

Send coupon for Bulletin 80-C

NIAGARA MACHINE & TOOL WORKS
683 Northland Ave., Buffalo, N. Y.
Please send copy of Bulletin 80-C.

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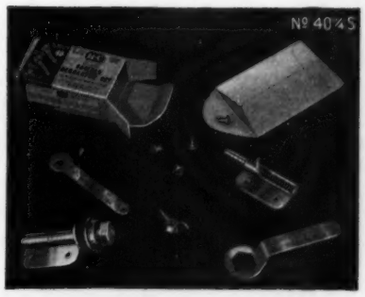
NIAGARA

H&C DAMPER REGULATOR SETS



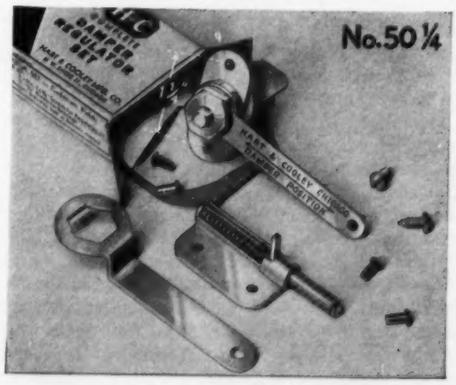
(No. 40¼ S Set with snap bearing is now furnished for No. 40¼ Set at 30c List Price)

Pick the Type that Suits you Best!

H&C offers three different sets in the 1/4" size, all furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.

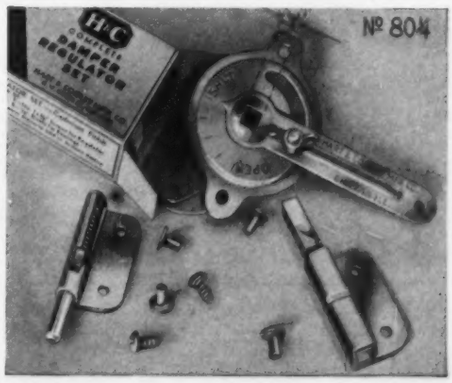
ECONOMY TYPE—Quality at a Price!
Furnished with both wing and hexagonal lock nuts. Made only with ¼" Bearings. No. 40¼ S—List Price 30c Set.

HART & COOLEY MANUFACTURING CO.
HOLLAND, MICHIGAN - - Chicago Office at 61 W. Kinzie Street



BRACKET TYPE (left)
With ¼" Bearings. No. 50¼—List Price 40c Set. With ⅜" Bearings. No. 50⅜—List Price 60c Set. ¼" size has snap end bearing.

DISK TYPE (right)
With ¼" Bearings. No. 80¼—List Price 40c Set. With ⅜" Bearings. No. 80⅜—List Price 60c Set. ¼" size has snap end bearing.



"WILL THE OLD BOY MISS YOU AGAIN THIS YEAR?"

● Do you still believe in Santa Claus and hope that the old sock will be full of profits even though your sales have been low again this year? Why not stop this wishful thinking and start fresh in '41 with a real profit line of automatic humidifiers—a line that has been tested and approved by hundreds of furnace dealers and a majority of the manufacturers of warm air furnaces. Both these dealers and manufacturers have found that the Skuttle line of automatic humdifiers give many years of trouble-free operation, are easily and quickly installed and are highly efficient. With this stamp of approval by leading dealers and manufacturers in the furnace field, you can be assured of increased profits if you handle the Skuttle line in '41. Let us prove to you that the Skuttle line is the profit line to handle. For information and prices see your local jobber or write us direct.

SKUTTLE *Sales* COMPANY

Air-Conditioning Equipment

999 FRANKLIN ST. • • • DETROIT, MICHIGAN

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on this page.

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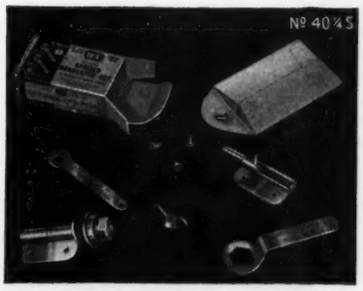

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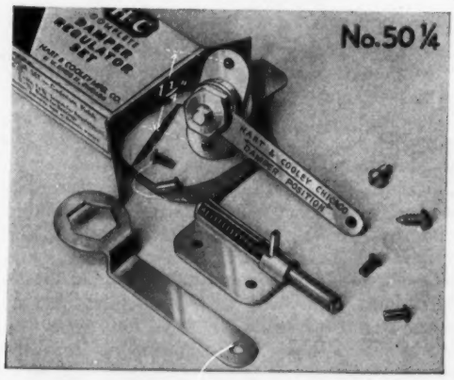

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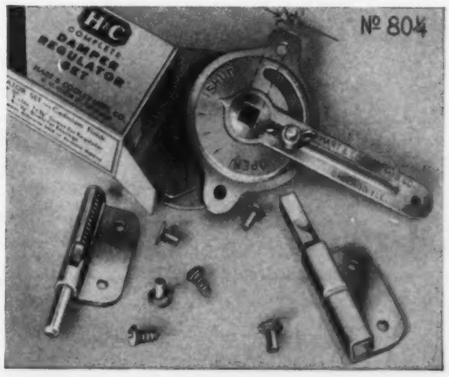

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SKUTTLE *Sales* COMPANY
Air-Conditioning Equipment
999 FRANKLIN ST. • • • DETROIT, MICHIGAN

Put Your Private Label On These Amazing New Air Conditioning Furnaces

Large Oil Burner Company Introduces Quality-Built, Mass Production Units For Quick Sales to Small Homes

One of America's oldest and best-known oil burner and air conditioner manufacturers has introduced a new line of low-cost Air Conditioning furnaces for small homes built on the first modern mass-production line in the industry. By acting quickly, you can be the first to introduce these new units in your territory. You can benefit from the many surprising features made possible by mass-production—UNDER YOUR OWN LABEL, or, if you prefer, under the manufacturer's label.

Through extensive savings made possible with production line manufacturing these new Air Conditioners equal in quality, efficiency and performance the most expensive units in the field today—yet are priced to compete with the cheap assembled units which so far have represented the only low-cost air conditioning equipment.

SELL UNDER YOUR BRAND NAME

This Company will sell you these remarkable new air conditioning units in lots of 50 or more delivered within one year, under your private brand name. Thus if you are now selling some other line of Oil Burners and Air Conditioners you can handle these Units without conflicting with your present line.

WHY COST ARE DOWN

This manufacturer has installed straight-line production methods by which these new units are built complete in one plant—from furnace to burner. He has installed special high-speed electric welding equipment and jigs designed for mass production use—special baking equipment to ensure perfect enameled surfaces on the burner and jackets—is spreading design and engineering costs over thousands of units instead of hundreds—is reducing sales costs to an absolute minimum in order to give wide-awake heating contractors and dealers a line of Air Conditioning units unequalled in the field at their amazingly low prices.

COMPLETE LINE—GET THE FACTS—MAIL COUPON

Don't miss this opportunity to step into the rapidly growing Air Conditioning field with a complete line of Air Conditioners to cover all requirements, from 80,000 to 200,000 B.T.U. (bonnet ratings). Get off on the right foot with the line which places Air Conditioning within the reach of builders of even the smallest type homes. Get in on the ground floor with the line which you'll agree is the most saleable—most efficient—the field has yet seen.

Get the facts and judge for yourself. BUT GET THE FACTS QUICKLY. Mail the Coupon—today.

Box 524, American Artisan
6 No. Michigan Ave., Chicago
Gentlemen: Please send me complete information about your new line of Mass-Production Built Air Conditioning furnaces. This request does not obligate me in any way.

Name .....

Address .....

City .....State .....

Association Activities . .

(*Continued from page 75*)

New York State

The New York State Sheet Metal, Roofing & Air Conditioning Contractors' Ass'n., Inc., has definitely set the dates for their coming 1941 Convention as March 25, 26 and 27 with headquarters at the Onondaga Hotel, Syracuse, New York.

Clarence J. Meyer, State Secretary.

◆

Wisconsin

The monthly meeting of the Board of Directors of the Sheet Metal Contractors Association of Wisconsin was held at 225 East Michigan Street on November 8—called to order by President T. P. Brenner.

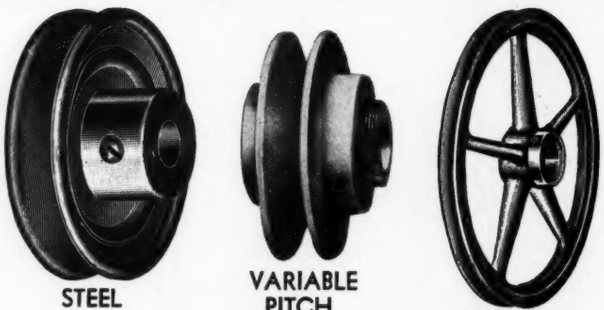
Communications from Directors Van Lannen and R. F. Gehrke and our reply to the Wisconsin State Council of Sheet Metal Contractors, relating to a new license law, were read and disposed of.

A detailed report of the February annual convention was submitted. The contracts for the Year Book—Buyers' Guide indicate as large a book as previously, the space for exhibitors is being rapidly disposed of, arrangements have been made and are being made for prominent speakers to address our delegates and visitors. The entertainment part of the program was considered, and suggestions offered. Tradepaper publicity was stressed.

Considerable time was devoted to the consideration of and discussion on the present labor situation, including apprentices and helpers—those from the various localities reporting their particular conditions.

Paul L. Biersach, Secretary.

MAUREY dependable V-PULLEYS



Heating and Air Conditioning Plants, Refrigeration Units, Fans, Blowers, Stokers and similar installations MUST have dependable V-Pulleys for F. H. P. Transmission.

Manufacturers of apparatus of this kind have found that Maurey V-Pulleys installed in their units assure dependable performance that can be GUARANTEED against "breakdown" caused by pulley failure.

When you consider your V-Pulley requirements for the coming year, be sure to compare Maurey V-Pulleys with any V-Pulley made, for Design—Workmanship—Appearance—Performance.

Write for Circulars describing Maurey Steel, Cast Iron and Variable Pitch V-Pulleys.

MAUREY MANUFACTURING CORP.
Wabash at 29th, Chicago, Illinois

South Chicago

A regular meeting of the Associated Sheet Metal and Air Conditioning Contractors Association was held Wednesday evening, Nov. 27th, at 11145 South Michigan Avenue. Ed. Carter of Snips Magazine spoke of a campaign by other heating interests to take warm-air heating out of government barracks specifications and of the successful efforts of the legislative committee to defeat the move. He also warned the assembly to disregard any advice received relative to non-payment of state sales tax.

A demonstration on the "Roll-Out" method of sheet metal pattern layout was given by Ralph Poe, who disp ayed many ingenious models used for faster and neater pattern work. After his talk, Mr. Poe held a drawing for several Ralpo cutters and pencil sharpeners.

Prominent among those in attendance were Messrs. Giermann and Holly of Northwestern Stove Company, Lou Reining of Automatic Humidifier Company and Mr. Hafer of Wheeling Corrugating Company.

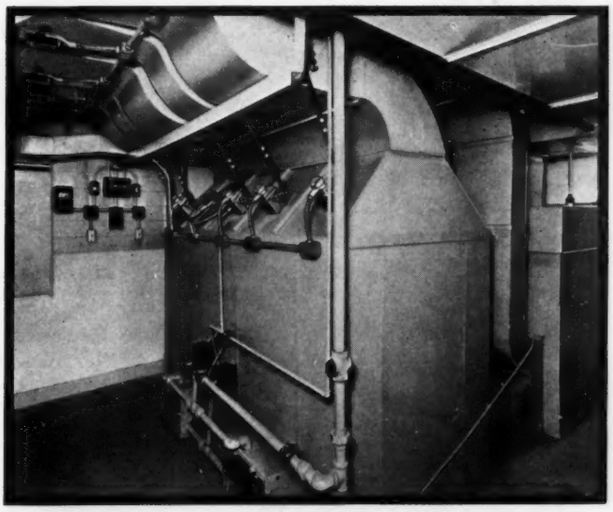
Chicago-North Side

The Furnace-Air Conditioning and Sheet Metal Institute of Chicago's North Side held an event Saturday Night December 7th in honor of one of the oldest and ablest members on the rolls—John Novak.

Mr. Novak is well known throughout the trade for his untiring efforts in behalf of the Institute, The Central Committee of Chicago and the industry in general and the turnout was a tribute to his popularity.

Among the guests who enjoyed the music and dancing and the excellent buffet supper were Ed Carter of Snips Magazine, Paul Biersach, W. G. Arndt and Frank Kramer of the Wisconsin State association, Dan Quinnan of Plibrico, Reid Mackin of International Heater, Lou Reinig of Automatic Humidifier, and Bill Giermann and John Spitzer of Chicago's South Side Associations.

The affair was given at the Wonderland Ballroom, 2934 Milwaukee Avenue.



FURNACE JOB DELUXE . . .

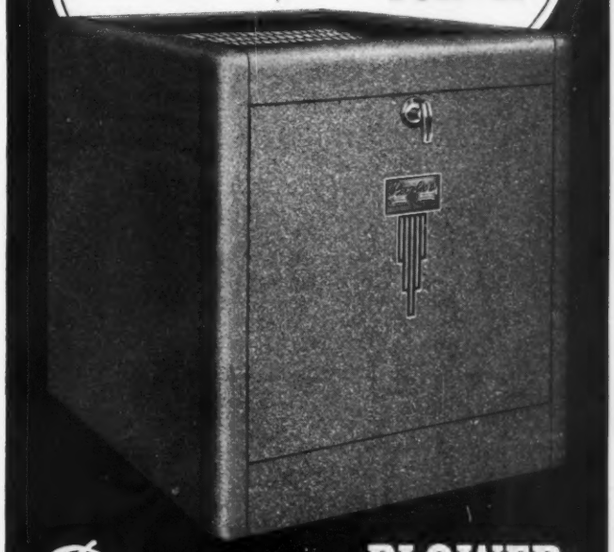
***featuring Automatic Electric* ZONE CONTROL**

BARBER-COLMAN DAMPER MOTOR

This installation of a gas-fired warm air furnace (and air conditioning unit) supplying five zones in a large residence, shows an efficient and effective use of Barber-Colman automatic *electric* controls. Temperatures in each of the five zones are uniformly maintained by zone thermostats governing individual mixing damper motors mounted, as shown, above the bonnet of the furnace. Automatic relative humidity control is also included. Further details of many possible applications of the Barber-Colman System will be furnished on request.

BARBER-COLMAN COMPANY
ROCKFORD • ILLINOIS

TIE UP WITH A *Leader* FOR '41



***Peerless*. BLOWER FILTER UNITS**

• You need be satisfied with nothing less than the best for *all* your 1941 installations. Take the lead with Peerless and *stay* at the head of the procession through these advantages that Peerless gives you:

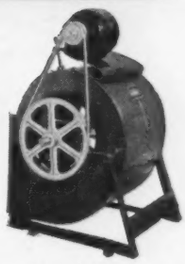
1. Remarkably satisfactory performance demonstrated by thousands of installations over many years.

2. Attractive appearance in color, line and modern style to harmonize with any furnace installation.

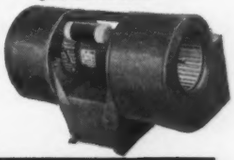
3. Selection of belt drive or direct drive with automatic control to meet the demands of any situation.

4. A product guaranteed by a manufacturer with 47 years of experience in building electric motors and blower equipment.

Mail the coupon for detail information or consult your nearest jobber.



Peerless Blowers are made in both direct and belt drives. On belt drive units, motor may be mounted either rear or top. Fit any style furnace —gas, oil or coal.



THE *Peerless* ELECTRIC CO.
WARREN, OHIO

THE PEERLESS ELECTRIC CO., WARREN, OHIO
Tell us more about your belt drive and direct drive blowers.

Name _____

Address _____

City _____ State _____

Let's make a
RESOLUTION
for 1941...

to make more profit!

☆ ☆ ☆

We're not oracles, or prophets—we don't have a single crystal ball that we can peer into and see the future! But—we know without any of these that **1941 is going to belong to Front Rank Heating Equipment!** 1940 is already the biggest year we've ever had . . . and the growing momentum toward 1941 indicates phenomenal increases . . . such great increases are anticipated over the banner year 1940, that already we have enlarged our great production facilities. Every day sees additional equipment arriving . . . and for every piece of new equipment there is increased personnel. Yes—we have great plans afoot for 1941—and that's not idle boasting, these plans are based on the fact that even with our present huge plant working at capacity, we have been hard pressed to keep abreast of the flood of orders pouring in. And you may just as well get your share of the 1941 PROFITS, because they're really going to roll in. There's still time to join our rapidly growing dealer organization . . . write for complete information on the new Front Rank Dealer Plan.

Wm. T. Mellow

WM. T. MELLOW, VICE-PRESIDENT

1210

FURNACE DIVISION
Liberty Foundry Co.
2500 OHIO ST. • SAINT LOUIS, MO.

Association Activities . .

Ohio Convention Dates

At a meeting of the officers and directors of the Ohio Sheet Metal Contractors Association, held at Columbus, on Wednesday November 27th, it was decided to make the dates of the 1941 convention—

February 25th, 26th, 27th, at Deshler Wallick Hotel, Columbus.

The Columbus group, led by Directors A. E. Bogen and William Lauer, are at work to make the 1941 meeting one to be long remembered. The various local committees will shortly be named and put into action, the Columbus Board members promise a hard working committee and a most instructive and entertaining time for the Contractors of Ohio that week. Columbus is the most central point and easy driving distance from any part of the State.

Ohio Contractors are asked to note the date and to mark their calendars accordingly. A good attendance is expected.

C. M. Gundlach, Secretary.

◆

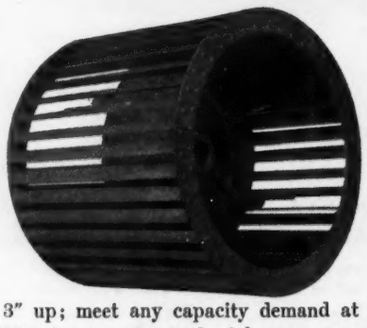
Stoker Exhibit

The Midwest Stoker Association, Chicago retail stoker organization, opened its permanent stoker and automatic coal heat exhibit at the Merchandise Mart on December 3.

This permanent exhibit, which is a part of the Merchandise Mart's Home Building Exhibit, has been created for the specific purpose of displaying the latest and most modern automatic coal burning equipment to prospective home owners and builders who visit the Home Building Exhibit every month. L. G. Briggs is president of the Midwest Stoker Association.

The Midwest Stoker Association's display will be officially known as the "Automatic Coal Heat Room."

BLOWER
WHEELS, HOUSINGS, ASSEMBLIES



Fan assemblies and wheels for every forced warm air heating and air conditioning need.

The complete assembly is offered in 11 standard sizes. Top mounted motor with adjustable base or bottom mounted motor with automatic belt adjustment are available. Bishop and Babcock Blower Wheels in ten diameters in widths from 3" up; meet any capacity demand at any operating speed.

Housings constructed of heavy gauge steel permit the assembly of bearing or motor supports directly on the housing without auxiliary supports. Any width in single or double inlet design.

Write for Bulletin 87 giving full data including capacities or have Bishop and Babcock engineers submit recommendations for your requirements.

TERRITORIES AVAILABLE FOR REPRESENTATIVES

The BISHOP & BABCOCK MFG. CO.
CLEVELAND, OHIO.
REPRESENTATIVES IN PRINCIPAL CITIES

Coming Conventions

1941

Jan. 13-15—National Air Conditioning Association. 1941 Convention. Blackstone Hotel, Chicago. Arthur F. Callahan, Executive Secretary, 220 E. 42nd St., New York City.

Jan. 15-16—Sheet Metal Contractors Association of Illinois. Annual. Jefferson Hotel, Peoria. (Exhibits—C. H. Lauerman, 237 East Tompkins St., Galesburg.)—J. E. McMackin, Salem, Secretary.

Feb. 4-6—Sheet Metal and Warm Air Heating Contractors Association of Indiana. Annual. Indianapolis. Paul R. Jordan, Exec. Secretary, 631 S. Delaware, Indianapolis.

Feb. 10-12—Sheet Metal Contractors Association of Wisconsin, Inc. Annual. Hotel Pfister. Paul L. Biersach, Secretary.

Feb. 25-27—Ohio Sheet Metal Contractors' Association. 1941 Convention. Deshler Wallick Hotel, Columbus. Carl M. Gundlach, Secretary.

Mar. 4-6—Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association. Annual. Kalamazoo. E. C. Spraker, Secy., 1560 Mackinaw Road, Grand Rapids.

Mar. 17-22—Oil Burner Institute. Exhibition and Annual Convention. Commercial Museum and Benjamin Franklin Hotel, Philadelphia. G. Harvey Porter, Man. Dir., 30 Rockefeller Plaza, New York City.

Mar. 25-27—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Assn., Inc. Annual. Hotel Onondaga, Syracuse. Clarence J. Meyer, State Secretary, 567 Genesee St., Buffalo.

Apr. 18-19—The Roofing & Sheet Metal Contractors' Association of Florida. Annual. Roosevelt Hotel, Jacksonville. L. A. Burgess, Secretary-Treasurer, 915 N. Poinsettia Ave., West Palm Beach.

TRIANGLE *Shock Absorbing* PILLOW BLOCK

(Patent Pending)

New Type Silent Bearing for Blower Service

Unique engineering encloses bushing, cushion and oil reservoir in pressed steel ball, making compact unit streamlined to present minimum of air restriction. Built-in, oil-proof, synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick-fed from large oil chamber insures lubrication for exceptionally long periods of operation. Positively self-aligning due to ball and socket action of spherical housing and mounting.

Results! Low cost, increased air delivery, utmost durability and freedom from vibration. Quotations submitted on request.

TRIANGLE MFG. CO., 395 Division St., Oshkosh, Wis.

Oil Burning Furnaces for Low Cost Houses should be equipped with DEPENDABLE A-P Controls

A-P Thermo Furnace Control Set . . . For Oil-Burning Furnaces.

A-P Engineers are thoroughly experienced with gravity fed oil heating. They know what YOU need in service-free fuel control. They know how to get every last bit of heating efficiency OUT of the furnace that the manufacturer built into it. There are A-P Oil-Burning Furnace Controls that will perform most any desired operation. Send for the complete catalog of these dependable controls.

The A-P trademark is a valuable advantage for you to have on all Oil-Burning Equipment you sell.

★ Manufacturers — if you have any gravity fed oil furnace control problems, use the knowledge of these experienced A-P control engineers.

AUTOMATIC PRODUCTS COMPANY

2452 NORTH THIRTY — SECOND STREET

MILWAUKEE WISCONSIN

...And that's not just one man's opinion, either!

You'll find it confirmed by Lockformer users everywhere . . . by men who have had their machines for several years . . . who have used them under all conditions and on all types and sizes of jobs.

They've proved that one man and a Lockformer can make more Pittsburgh Locks, hour for hour, than sixteen men working at eight brakes . . . that Lockformer Locks are better looking, better fitting, require no further prying open . . . that less material is used and that sheets need no re-squaring.

3 JOBS—WITHOUT CHANGEOVER

The new Power Flanger Attachment is available for the Lockformers 20 and 22 as well as the 24. That means that either of the former machines, so equipped, can be used for straight OR CURVED Right Angle Flanges, Pittsburgh Locks, and either Drive Cleats or Double Seam Locks, without any changeover whatever. No one of the three operations interferes with the other two!

Prices start at $148.00

TRY IT YOURSELF

Accept our invitation to try a portable Lockformer right in your own shop. See for yourself how much it's costing you to be without one. A postcard will bring you the name of the Distributor nearest you. No obligation, naturally.

THE LOCKFORMER CO.
4615 ARTHINGTON STREET, CHICAGO, ILLINOIS

With the Manufacturers . . .

R. G. Waldron with Homer Furnace

Homer Furnace & Foundry Corporation, Coldwater, Michigan, announces that R. G. (Jess) Waldron, in the employ of the corporation several months prior to the death of W. J. Carlyle, will succeed Mr. Carlyle. Mr. Waldron has a thorough knowledge of the business.

Perfex Moves New York Office

The Perfex Corporation, Milwaukee, manufacturers of Twin Contact Controls for automatic heating equipment, announces the removal of its New York office from 90 West Street to 370 Lexington Avenue, in the interests of better customer service.

George D. Kingsland, who recently became associated with the Perfex Corporation as vice president in charge of its Eastern Sales Division, will make the New York office his headquarters.

Airtemp District Managers Meet

District managers of the Airtemp Division of the Chrysler Corporation, Dayton, attended a 5-day conference the week of November 11. The 1941 line of Airtemp heating and cooling units were presented and their many features explained to the field force by factory executives.

Frank Packer with Payne Furnace

Frank Packer has recently become associated with the Payne Furnace & Supply Company, Beverly Hills, California, as a special representative and will work for the time being in the southern California territory seeking to co-ordinate the merchandising efforts of the company and their retail stores, dealers and the gas companies.

Mr. Packer was for 35 years connected with the Welsbach Company, manufacturers of water heaters.

QUALITY EQUIPMENT-- FROM HESS-- COSTS LESS

DEALERS---Write for our New 1941 Portfolio

By selling — repairing, modernizing or replacements, needed by owners of a majority of heating plants now in use.

HESS BLOWER FILTER UNITS
HESS WELDED STEEL FURNACES
HESS AUTOMATIC OIL BURNERS
HESS AUTOMATIC COAL STOKERS

ARE GREATEST VALUES AT LOWEST PRICES

The Hess line is complete for every dealer requirement, distinctively different and more saleable. Financing plan and territory plan—helps Hess dealers.

WRITE FOR DEALER PORTFOLIO
HESS WARMING & VENTILATING CO.
1211-27 S. WESTERN AVE. Founded 1873
CHICAGO, ILLINOIS

Howard D. Matthews Rejoins Chace

W. M. Chace Company, 1606 Beard Avenue, Detroit, makers of Chace thermostatic bimetals, announces the re-acquisition of the services of Howard D. Matthews in an advisory and consultant capacity.

Mr. Matthews is an electrical engineer for more than twenty years closely associated with the development of thermostatic metals

◆

Brauer Markets Fiberglass

A. G. Brauer Supply Company, 2100 Washington Ave., St. Louis, has been appointed exclusive marketers of Fiberglas for the area bounded on the north by Davenport, Iowa, on the east by Evansville, Indiana, on the south by Memphis, Tennessee, and on the west by Jefferson City, by the Owens-Corning Corporation of Toledo, makers of this insulating material.

As exclusive marketers of Fiberglas, the Brauer concern will have full responsibility for the appointment of distributors, and dealers in this area, in addition to working with actual users toward the solution of problems involving the use of Fiberglas for air-conditioning and heating insulation.

◆

Hohler Purchases Building

Franklin D. Hohler, president and general manager of the Hohler Furnace and Sheet Metal Co., Sandusky, Ohio, announced on October 12 that he had completed arrangements for the purchase of the building occupied by his concern at Decatur and W. Water Streets, from the John Mertz Estate. The structure is 66 x 130 feet and was built in 1916.

Mr. Hohler took over the business of the sheet metal products factory of the Mertz Manufacturing Co. in February of 1929.

The Hohler Furnace and Sheet Metal Company manufactures industrial sheet metal products and is an exclusive distributor for Round Oak furnaces in his district.

Talk up BALANCED Air-Moisture with

THERMO-DRIP HUMIDIFIER

For All Warm Air Heated Homes

MAKE THESE EASY, EXTRA PROFITS

Thermo-Drip Humidifiers balance moisture with temperature because they're heat-controlled. Their drip feed is stepped up, throttled or shut off automatically by furnace bonnet temperatures—no switches, no instruments, no floats or mechanical parts. Homeowners understand this operating principle . . . they know it is more scientific, more efficient, more dependable. Cash in on it for easy, profitable sales. Ask your wholesaler or write us for full details.

AUTOMATIC HUMIDIFIER CO.

18th and Main Streets CEDAR FALLS, IOWA

THERMO-DRIP

Automatic **HUMIDIFIER**

ALTER EGO: Literally "one's other self"— the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: We have the *ability* to get faster welding and smoother, stronger welds. Stop imagining—even to yourself —that we haven't.

Well, the shop hasn't taken any prizes so far. At least our work isn't up to expectations.

ALTER EGO: Then the boys aren't getting that something which gives them *mastership* of their ability.

You've hit the words. Now to put them to music. Let's find that something.

ALTER EGO: Maybe they need a welder that will add *flexibility* to *ability*. Why not get Lincoln's suggestion.

• •

LINCOLN SUGGESTS: A full kit of tools is essential for *mastership* of any skilled workman's ability. In arc welding, the full benefit of the welder's skill is assured by "Shield-Arc's" Dual Continuous Control which allows independent adjustment of both the *type* of arc and its *intensity* for faster welding and better welds. How? See Page 6, Bulletin 412.

LINCOLN "SHIELD-ARC" WELDING THE LINCOLN ELECTRIC COMPANY Cleveland, Ohio

Largest Manufacturers of Arc Welding Equipment in the World

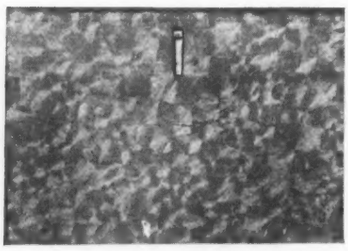
PRE-NOTCH *means* *AIR-TIGHT*

Here is a time-saving, complaint-eliminating feature that is winning hundreds of new users for Gray "Snap-Rite" pipe systems every day.

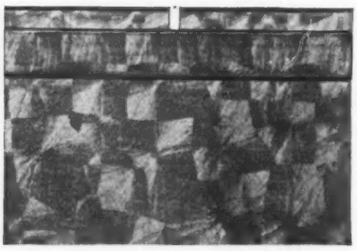
All notching on trunk pipe corners and takeoffs is done away with in the Gray "PRE-NOTCH" Pipe—all notching is done with perfect precision at the factory.

To install a branch takeoff with Gray "PRE-NOTCH" together with succeeding length of square pipe as in Fig. 3 below, simply complete the notching by cutting out the small section of metal remaining above the cleat.

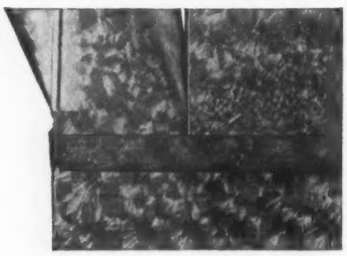
Result: an air-tight installation all the way! Takeoff and next length of pipe snap snugly into place without guesswork or waste of time.



This rear view of the pipe cleat shows how trunk pipe and elbows are shipped from the factory with the "PRE-NOTCH" feature at 4", 6" and 8" points from both sides.



This front view of the cleat shows the completed notching which is done on the job. The section of metal above the cleat as shown in upper photo is easily cut out without distortion of pipe.



When the takeoff installation is completed, without notching on either takeoff or trunk pipe, both snap snugly into place giving you this neat, air-tight, time-saving job.

Write today for descriptive material on the complete line of Gray Snap-Rite Pipe and Fittings for air conditioning and warm air heating systems. Gray Gutter Accessories will save time and money for you, too.

GRAY METAL PRODUCTS, Inc.
ROCHESTER NEW YORK

Snap-Rite

With the Manufacturers . .

American Air Filter Not Sold

The American Air Filter Company, Louisville, Ky., announces that reports of its purchase by a large electrical manufacturing company were premature. Negotiations which never advanced beyond the preliminary stage, have been definitely abandoned by mutual consent of both companies. There has been no change in ownership, management or field representation of the American Air Filter Company.

Aerial view of the addition to the Schwitzer-Cummins Company's stoker and blower business at Indianapolis, Indiana. The purchase of this plant will enable the company to increase production of blowers, furnaces and winter air conditioning, and to improve service.

W. J. Carlyle

Homer Furnace & Foundry Corporation, Coldwater, Michigan, announces with regret the death of W. J. Carlyle, former general manager and treasurer, on October 22, 1940. Mr. Carlyle died after several months' illness and was somewhat inactive during this time.

DEALERS!

THERE ARE GREAT PROFITS FOR YOU IN . . .

CONVECTOR AUTOMATIC HUMIDIFIERS

S 181

Here is the most saleable humidifier in the Warm Air Heating Field . . . the humidifier that delivers more pounds of humidification per dollar cost than any other . . . the only humidifier that has National Plumbing Laboratory acceptance against back syphonage codes . . . the humidifier that is built to last . . . priced to sell, and make you a handsome profit. These Maid-O'-Mist Automatic Humidifiers for Warm Air and Floor Furnaces assure ample humidification, are easy to install and fool-proof in operation. Made in 18 sizes with single, double and four troughs and designed to fit straight or sloping bonnets, they meet the humidification requirements of the largest or smallest furnace. They are made with either automatic or drip feeds. The water feeder on the Automatic Convector is made of brass, copper and Monel Metal, the float is made of copper, and all are completely nickle plated to avoid the possibility of corrosion. Copper troughs are spaced one inch apart assuring unrestricted air flow through the Patented Metal Edge Replaceable Evaporators. Remember, Maid-O'-Mist Humidifiers are Standard Equipment on many of the country's leading furnaces.

•

Maid-O'-Mist manufactures humidifiers for all types of Warm Air, Steam, Hot Water, and Vapor Heating Systems.

•

WRITE FOR FULL INFORMATION TODAY

MAID-O'-MIST INC.
213 NORTH ABERDEEN STREET
CHICAGO ILLINOIS

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

Sixtieth Anniversary

On February 13th, The Excelsior Steel Furnace Company of Chicago will complete sixty years of successful business history under the personal direction of its founder, A. W. Glessner, who, at the age of nineteen, started in business with a borrowed capital of $2,500. The venture was successful from the start and no additional investment was required and the patronage accorded the company increased rapidly until it now operates five plants and carries stocks in a large number of cities. Upon organizing the corporation the slogan "The Best and ONLY the Best" which was adopted is still shown on its stationery.

In 1887 the company began manufacturing furnace pipe and fittings and a number of years ago it pioneered the production of prefabricated ducts and fittings. More than half a century ago it engaged in the manufacture of stove pipe and elbows. It later entered into the manufacture of a large number of metal specialties for which it built special machinery. The company operates a machine and die plant and in addition makes all of its presses. It does all of its pattern work and employs artisans capable of maintaining its plant in fine condition.

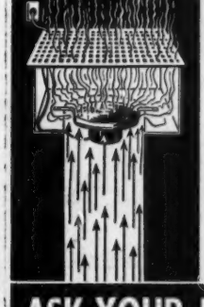
Excelsior has spent large sums in research work, has taken out a large number of patents and gives employment to a corps of engineers engaged in developing new heating units and in making plans and estimates for the installation of its line of apparatus. It carries large stocks and has recently increased its storage space by the addition of two more buildings in Chicago and has leased more space in Brooklyn adding 50 per cent to its plant there.

Excelsior recently printed a special anniversary edition of its manual and code pamphlet in which it made an unusual offer to furnace installers, agreeing to set aside 2,000 of its Era B furnace for sale at a reduction from its established prices as an appreciation of the generous patronage accorded throughout its long history.

COLD RUNS BANISHED!

WITH THE Furnace Man's Friend

THE VICTOR HEAT BOOSTER



This amazingly effective device not only boosts hot air into hard-to-heat rooms, it boosts profits into the pocket of the furnace man.

The Victor Booster needs only to be set in place, plugged into any electric outlet, and out pours a rich flow of hot air—not from an overfired furnace, but from an ordinary everyday fire. Two models, floor and wall. Liberal Discounts. Write today for detailed literature and prices.

VICTOR ELECTRIC PRODUCTS, Inc.
Dept. HB-5 2950 Robertson Ave. Cincinnati, Ohio

ASK YOUR JOBBER OR WRITE DIRECT

SELL EQUIPMENT THAT IS *Twice Tested*

Durability, performance, economy are *twice assured* in PAYNE gas-fired furnaces... first by AGA Blue Star approval, then by the endorsement of our own relentless "proving ground," the PAYNE Testing Laboratory. Thus, every PAYNE owner is an enthusiastic user of comfortable, economical gas heat. ☆ There is a style and size of PAYNE Furnace for every house in town. Display, recommend, *sell* PAYNEHEAT in your territory.

Write us NOW for information on our dealer plan. Your selling effort is backed by generous national advertising.

Floor Furnaces—Modern Console Heaters—Duplex Furnaces—Forced Air Units—Zoneair Units—Gravity Furnaces... a PAYNE gas appliance for any size job. ☆ Dealers—a few territories still open. Write us.

THE IDEAL FUEL GAS

PAYNEHEAT

Payne FURNACE & SUPPLY CO., INC.
BEVERLY HILLS • CALIFORNIA

THE New NO. 250
CAMPBELL
NIBBLER

HAS THESE
4 IMPORTANT New ADVANTAGES

Cuts Wider Stock—takes 1/4" mild steel and 3/16" stainless up to 72" wide. Depth of throat 36". **Has Three Speeds**—350, 500 and 800 R.P.M. with easy change-over. **Stroke Is Adjustable**—can be set for any stock thickness from very thin to capacity of machine. Permits convenient use of thin templates. **Cuts in All Directions**—while the operator keeps a two-hand grip on the material.

BUY ACCO QUALITY in Campbell Cutting Machines; Ford Chain Blocks and Trolleys; Page Welding Electrodes; American Chains; Lay-Set Preformed Wire Rope; Reading-Pratt & Cady Valves; Page Wire Fence.

ANDREW C. CAMPBELL DIVISION
Designers and Builders of Special Machinery
BRIDGEPORT • CONNECTICUT
In Business for Your Safety

TRADE MARK ACCO

AMERICAN CHAIN & CABLE COMPANY, Inc.

JOHN EDGAR HOOVER
DIRECTOR

Federal Bureau of Investigation
United States Department of Justice
Washington, D. C.

October 31, 1940

Associated Business Papers, Inc.
369 Lexington Avenue
New York, New York

Gentlemen:

In the war-torn world of today America must strengthen her internal and external fortifications if she is to survive the menace of totalitarianism. The protection of our industrial facilities to insure the uninterrupted production of goods and material is essential to our national defense. Based upon this premise the FBI in September of 1939, in accordance with the request of the War and Navy Departments, inaugurated a program to survey the protective facilities of manufacturing establishments having large contracts to provide the government with defense materials. The purpose of the surveys is to submit recommendations to bolster the physical protective facilities of the manufacturing plants for the prevention of sabotage and espionage activities.

The first and final responsibility to give speed and strength to our national defense program by protection against espionage and sabotage lies with industry itself. Only through the energy and alertness of its officials and workers will the full measure of preparedness be attained.

In line with this plant survey program and to assist industrial concerns and municipalities in establishing effective protection against possibilities of acts of espionage and sabotage the FBI prepared a comprehensive booklet entitled "Suggestions for Protection of Industrial Facilities." Because of its confidential nature this booklet is limited in distribution to heads of duly constituted law enforcement agencies and executive officials of industrial concerns manufacturing defense materials under government contracts.

In response to the many questions as to how to obtain this publication I wish to state that a copy will be furnished an industrial concern upon the written request of an executive official.

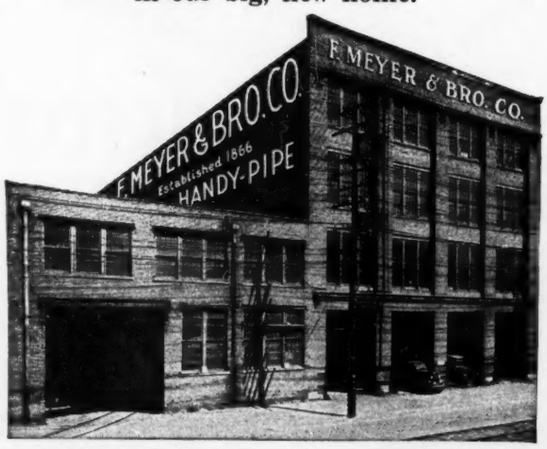
Sincerely yours,

J. Edgar Hoover

John Edgar Hoover
Director

Here's the place to send your
PIPE AND FITTINGS
orders to in '41

We're "In Production" in our big, new home.



F. MEYER & BRO. CO., PEORIA, ILL.

Rearmament Housing Is Our "Big" Market

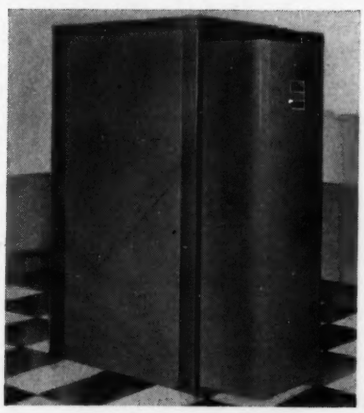
(*Continued from page 29*)

tractor. Any industry or national association voice we may possess, should be aimed to impress on Washington agencies involved in this housing program the grave need for adequate heating. To drive home the fact that adequate heating is becoming more and more a *first* consideration of the renter, builder or buyer. That heating systems should *now* be designed so that the same system will not be antiquated or below standard ten or twenty years hence.

Any local association can also impress these facts on any local agencies involved in the housing program. And, last, the individual can also do his bit by spreading the fact that only good heating is good enough—no matter how low priced the houses are to be.

In connection with this suggestion, we strongly recommend a studied reading of this month's Washington Letter. In the Letter will be found a resume of housing as of November, 1940, and more than an inkling of the tremendous scope of the problem and its proposed solution. The potential is worth everyone's earnest effort.

SUN
FUEL MASTER



AUTOMATIC OIL FURNACES
MUST be Good!

Write Today

J. V. PATTEN COMPANY
200 DeKalb Ave. **Sycamore, Ill.**

THE popular Auer "7000" Line offers you substantial quality in air conditioning registers and intakes—at a real saving. This Auer Airo-Flex is carefully made and finished, is of simple construction, without complicated parts or installation problems.

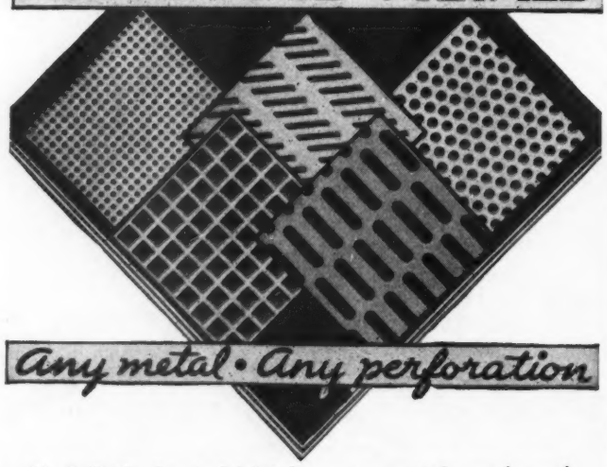
It gives you fine appearance and unusual economy. The "7000" Register is adjustable for directional flow control—up, straight, or down. Grille bars are set, when delivered, for 22½° downward deflection, but are easily adjustable for other angles. These registers are equipped with single louvre and made in a complete line for wall and baseboard use.

Ask for complete Auer Register Book 40, and name of your nearest Auer distributor. Separate Catalog "G" also available on Auer Grilles.

THE AUER REGISTER COMPANY
3608 Payne Avenue Cleveland, Ohio

AUER REGISTERS
& GRILLES
For Air Conditioning *and* Gravity

PERFORATED METALS



H. & K. Perforated Metals are accurately made and embrace a great variety of perforations for use in screening, grading, ventilating and straining of different substances.

Tell us your requirements and we will send booklet showing actual sizes of perforations.

The Harrington & King PERFORATING CO.

5649 Fillmore Street, Chicago - 114 Liberty Street, New York

Kruckman's Washington Letter

(*Continued from page* 30)

The equipment of these houses is practically the same as those at Ft Knox **except that the heating plant is a circulating gas heater in the living room** placed against the wall on the kitchen side. It is a box-type unit with a fan. Also in the kitchen the four burner stove burns gas. The Ft. Huachuca houses have rock-wool insulation, are finished on the outside with dobe masonry, gaily colored, have rough wood shutters and single-pitch roofs with widely projecting eaves. The plaster-board walls and ceilings are painted.

The equipment purchased for all defense homes is bought in lots of 25,000 each. George Landick, Jr., is in charge of this buying by direct negotiated deals. He is to be found at the Procurement Division in Washington. All duct work and materials are negotiated on the job by the general contractor in charge.

In San Diego, California, where the need for housing is desperate, some of the suddenly added 30,000 residents are being sheltered in portable houses. In Newport News, Va., as in San Diego and elsewhere, there is need for more permanent homes. Many of the workers regularly earn from $75 per week up. Where the demand for the permanent home has arisen, the Defense Homes Corporation steps in, at the invitation of Mr. Palmer. It builds homes with 2 and 3 bedrooms, the garden type home, one-family detached units or 2 and 4-family houses. The Defense Homes fit into the FHA pattern and standards, being underwritten by the FHA. They rent for $35 to $50 a month and the occupant is given every opportunity to buy them. At any rate they are planned to become a permanent addition to the housing resources of the community.

ATH-A-NOR

Over Fifty Years of Quality Heating

The key to business success is, in a large number of cases, customer recommendation. You'll find that a good furnace job that performs season after season with little or no attention, and giving top performance all the way will be one of your best assets.

You can be sure of modern, efficient heating on all those jobs if you install the time-tested ATH-A-NOR. Here's a furnace that will perform on either gravity or air conditioning jobs with equal facility. Strong construction, modern appearance, efficient performance . . . they all add up to one thing, better jobs and better profits. Write today for more information.

THE MAY-FIEBEGER COMPANY
NEWARK OHIO

Over a million reasons

why you should install

Randall Pillow Blocks

There have been over a million Randall pillow blocks installed on almost every type of equipment . . . over a million good reasons to standardize on Randalls. The efficient operation of a million Randall pillow blocks is adequate reason for installing Randalls on your equipment. Reliable, economical and *quiet*, they give added years of consistently satisfactory service. They are self-lubricating, self-aligning, and require only minimum maintenance.

One-Piece Steel Housing Pillow Block

•

Write for 1941 *catalog.*

RANDALL GRAPHITE PRODUCTS CORP.
DEPT. 1211, 609 W. LAKE ST., CHICAGO, ILL.

The Defense Homes Corporation is a subsidiary of the RFC and looks upon its task much as a private operator regards his project to build homes for the market. Defense Homes has $10,000,000 which it uses to absorb the equity usually taken by the private person when the FHA guarantees the loan made by the bank or other financial institution. FHA guarantees the loan for Defense Homes operations exactly as it underwrites other loans. Usually each separate local project is covered by a local corporation operating under the specific State laws of the locality; but the stock of the corporation is owned wholly by the Defense Homes Corporation in Washington. George B. Williams, president of the RFC Mortgage Corporation, is the vice-president in charge of the Defense Homes Corporation and is the man to whom you should address any questions about any details. He is genial and active and competent.

Washington Expects a Boom

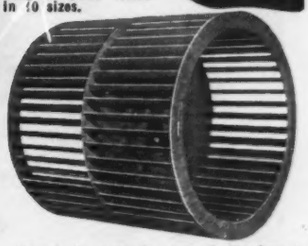
Washington holds that only the surface has been scratched in the expansion of the plants for defense industries. They think that the Great Momentum begins to swing after the first of the year and that we will not really know about the flood-tide of this unparalleled prosperity until late 1941.

Bear in mind that Washington has almost fanatical faith in the fact that we virtually have struck the gait of an all-time high in everything your imagination can encompass, that we not only have our own defense industries and their near and remote corollaries to consider, but that we will produce more and more various kinds of materials for England than most of us have ever dreamt of.

The financial obstacle of Great Britain's empty purse is expected to be met by direct loans or credits as a technic of our own intimate defense. The White House, off the record, anticipates we will be burgeoning with a national income approaching $125,000,000,000 per annum by the end of 1941 and that such income will not only

We Use CLARAGE FANS because Every Wheel is BOTH Statically and Dynamically Balanced

At left — complete fan for forced air heating or year-'round conditioning. Very compact. Built in 10 sizes.



Or wheels only in any of 10 sizes to give any desired volume and pressure.

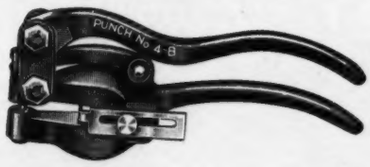
TRY these QUIET-RUNNING UNITS

Standardize on Clarage — and protect your jobs against "fan troubles." Perfectly balanced wheels, improved bearings and slow operating speeds insure QUIETNESS — guarantee long service. Most widely used equipment in your field. Write for Bulletin 33 and see why!

COMPLETE AIR CONDITIONING • COOLING • VENTILATION • FACTORY HEATING • MECHANICAL DRAFT • FANS and BLOWERS for INDUSTRIAL NEEDS

CLARAGE FAN COMPANY - KALAMAZOO, MICH.
SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

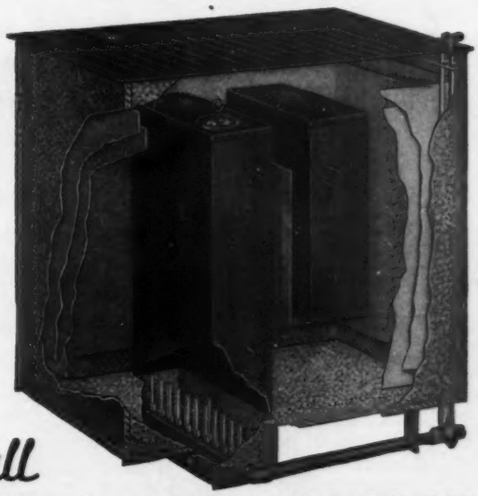
A REAL Time Saver



The No. 4B PUNCH by Whitney

This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of ¼" through 16 ga., weight 3 pounds, 8½" in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.



Install COLE'S FLOOR FURNACE

Here is the floor furnace that burns natural, artificial or mixed gas with greatest economy and efficiency . . . Cole's Gas Fired Floor Furnaces are equipped with the patented burner whose automatic air intake requires no air adjustments.

The inner heating unit of the Cole Floor Furnace is of full vitreous porcelain enamel. Three walled galvanized steel casing. Full porcelain casing at small extra cost.

Large heating surface and long delayed flue travel get maximum efficiency from fuel. Unit crimped and sealed by special Cole process insuring gas-tight and stay-tight construction.

Combination safety pilot and automatic thermostatic heat control available for all Cole Floor Furnaces in the 20-30-40 series.

Write for full details today.

COLE HOT BLAST MANUFACTURING CO.
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★ Tanks and Guards on *Famous*
K & T MILLING MACHINES
Made with
LIBERT Hi-Speed SHEAR

In the great Kearney & Trecker Factory, Milwaukee, dedicated to high precision standards in Milling Machines, LIBERT Hi-Speed SHEARS stand up to all their requirements for high speed production and minute accuracy.

K & T Machinists like the Libert Shear for its fast, accurate cutting, its ability to take inside cuts without starting hole, and the sure, easy way it takes all manner of intricate shapes without adjustment.

A LIBERT Hi-Speed SHEAR pays for itself in many plants. Let us show how YOU may benefit by its superior shearing efficiency and versatility.

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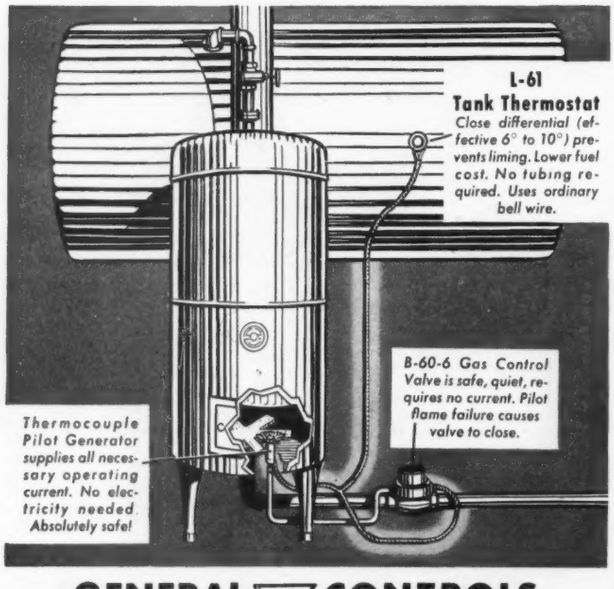
Everything you need FOR A BETTER
AND MORE SIMPLIFIED CONTROL AT LOW COST
FOR DOMESTIC AND COMMERCIAL INSTALLATIONS

GENERAL CONTROLS
BX-250 WATER HEATER PACKAGE SET


L-61
Tank Thermostat
Close differential (effective 6° to 10°) prevents liming. Lower fuel cost. No tubing required. Uses ordinary bell wire.
B-60-6 Gas Control Valve is safe, quiet, requires no current. Pilot flame failure causes valve to close.
Thermocouple Pilot Generator supplies all necessary operating current. No electricity needed. Absolutely safe!

GENERAL CONTROLS
450 East Ohio Street, Chicago, Ill.
267 Fifth Avenue, New York City

reduce the number of unemployed to somewhere between 2,000,000 and 4,000,000, but that it will enable us to meet a tax rate that should cover our own expenses and the loans we make to Britain. This spending into prosperity, incidentally, is expected to level great fortunes, and to spread the benefits uniformly at standard levels attainable by everybody. What to call this controlled economy has not yet been solved in Washington.

War Industry to Be Moved West

The point at interest immediately is the fact that most of the new industrial plants, according to Capital ideas, will be brought into existence beyond the Mississippi, in the Southwest and in the West. The purpose is to take the industry to the places where the people live, rather than to take the people to the places where the industries operate. This process, it is believed, will give employment to millions in the rural areas. And it is in the rural areas where the Farm Security Administration will do its building.

FSA is a banking and building organism. It has been building for farmers the past 5 years. It prides itself on the record that it has built the lowest-cost homes in history. It has built frame farm homes, with 3 bedrooms, kitchen and living-dining space, and front and rear porches and with a fireplace and one auxiliary flue, **without utilities**, for $1,265 each. It has wired these homes in anticipation of REA electricity for an additional $30; and it has put in a bathroom, a septic tank and water connections with a small motor driven pump and a pressure tank, for $500 more. And it has installed a warm-air or pipeless furnace which brought the over-all cost up to $2,300. These houses have two coats of paint, the unplastered walls and ceilings are stained, and the kitchen has a sink, a drainspout and grease-tap and a cabinet.

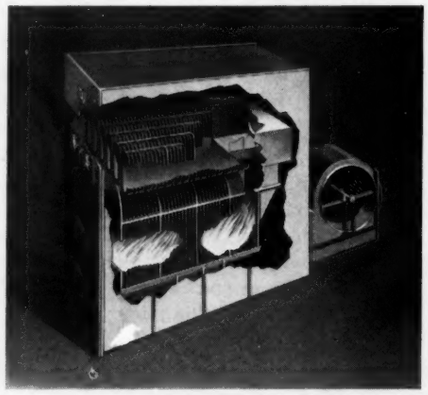
The FSA makes a very special point of its policy always to follow local custom, to use local materials and local resources and local people. It has decentralized its

Get in on the BIG work
with *Streamline* Heaters!

A BIG HEATER . . . FOR BIG WORK. Starting at a point well above the output of the largest residence-heaters, STREAMLINE capacities range upward, singly or in batteries, to carry any heating load desired. The STREAMLINE heater is the HEAVY-DUTY equipment for such jobs as these: Schools, Churches, Theatres, Warehouses, Department Stores, or any building containing large rooms. Inquiries as to data and prices are cordially invited.

Check these features:

1. Built of Heavy Cast-Iron . . . for long life.
2. "Sealed Heat" . . . for Fuel Economy.
3. "Streamlined" Airflow . . . for top efficiency.
4. Air-Conditioning facilitated.
5. "Free Expansion" . . . improved design.



Write today for details.

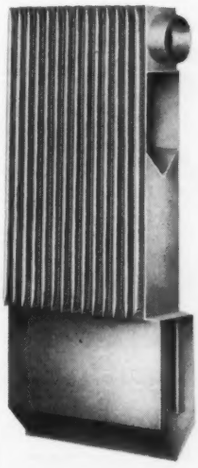
THERMAL ENGINEERING ASSOCIATES
1618 Northshore Ave. Chicago, Illinois

administration so that its major business is directed from 8 principal regional offices and under the regional offices there are many local offices in various States and communities. If you wish to communicate with the man who can tell you fully about prospective plans, address Leo M. Stock, Assistant Chief Engineer, Farm Security Administration, Washington, D. C. It will be wise to keep in touch with the Administration because it will unquestionably have much to do with building defense housing in the industrial areas that will spring up in the farmlands. It is expected the FSA will build shops, theaters, schools, churches, and all the other units of a full-blown town. It has already done so, repeatedly.

All agencies will have a hand in building defense housing in the majority of industrial communities. Housing sponsored by the Army has priority. Many plants will be built or expanded by industries on their own initiative with their own resources. Housing in these communities will largely be built by private enterprise. Probably much of it will be built under FHA stimulus. The Federal Home Loan Bank Board also will help with this kind of housing. They say here in Washington that there is $5,000,000,000 in 4,000 finance institutions scattered around the country waiting to be loaned for housing enterprises. If you are in doubt about the agency responsible for the operation of any particular project ask the Quartermaster Construction Officer nearest to you as listed in the AMERICAN ARTISAN in November. He is almost certain to know; if he doesn't he will know who does know.

If you want advice or information about subcontracts; or if you wish help in financing any undertaking in connection with defense housing get in touch with the Federal Reserve Bank or its branch nearest to you. Your bank will be able to tell you where it is located. There are 42 scattered around the country. Each of these Federal Reserve units has a man especially capable of helping smaller business men to get defense subcontracts and to arrange methods by which they can obtain funds to finance the work.

This Multiple-Fin, Hollow-Baffle Element



***in* UTILITY**
Forced Air Furnaces
is Guaranteed
Against Burnout Forever

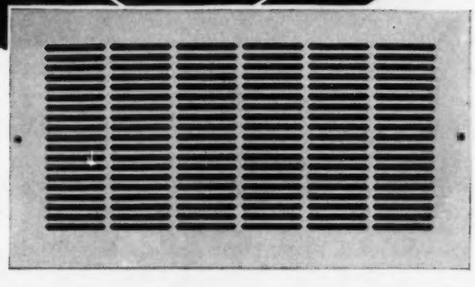
Other Utility Features are compact design, dynamically balanced blower, built-in motor overload protection and automatic controls.

Complete line of gas-fired basement and closet furnaces, floor furnaces and circulating heaters.

Write for catalogs and prices

UTILITY FAN CORPORATION
2528 Santa Fe Ave., Los Angeles, Calif.

Waterloo REGISTERS

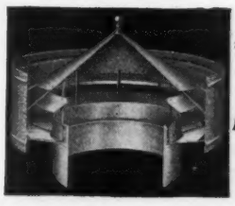


New R-600 Registers Provide
QUALITY AT LOWEST COST!

Designed for forced air systems in low cost homes. Attractively designed—a variety of finishes—and a price-plus-quality appeal that's hard to beat. Write for complete details.

WATERLOO REGISTER COMPANY
WATERLOO, IOWA SEATTLE, WASH.
Representatives in principal cities.

TURN TO BURT FOR YOUR ROOF VENTILATORS



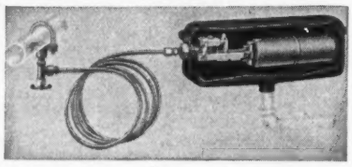
"Standard Gravity"

It is a great convenience to be able to supply your every need in roof ventilators from one reliable source. Burt makes a type and size for every purpose; and in every case you can give your customer "More Air per Dollar" with a Burt. Remember, too, Burt Engineers are glad to help you both get and install the job with layout and estimating service.

THE BURT MFG. CO.
ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS
301 Main St., Akron, Ohio

SEND FOR CATALOGS
Burt Engineers are glad to help on plans

Tomorrow's humidifier valve .... today!



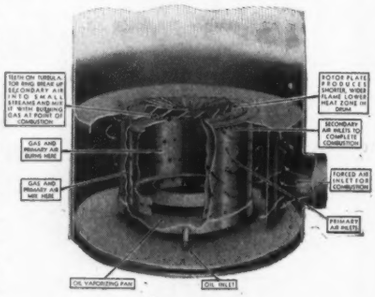
HERE'S the end of your humidifying troubles —a float valve with a new snap action that prevents plugging up or sticking open. Snaps open wide when water drops ¼-inch in pan; snaps to leak-tight closure against any water pressure when water level is restored. Has greater capacity—withstands high temperature—doesn't wire draw or corrode. Write for engineering data proving its superiority.

McDONNELL & MILLER
1318 Wrigley Building, Chicago, Ill.

The New McDONNELL Humidifier Water Control

REVOLUTIONIZING THE OIL DEVICES INDUSTRY!

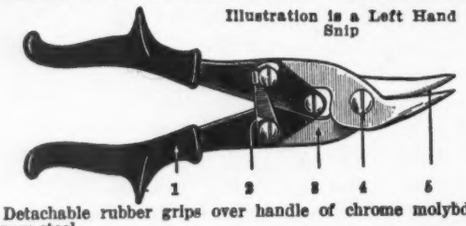
The New MONOGRAM Patented Turbulent Flame "Vaporizing" Burner vaporizes the oil quicker and by proper mixture of both primary and secondary air produces a clean, quiet gas flame made from oil. MONOGRAM features this burner in all of its oil heating units (space heaters and automatic warm air furnaces) and has obtained the highest known operating efficiency. For further information about trouble-free oil heating service that can be operated at a lower cost—WRITE US TODAY.



The Quincy Stove Mfg. Co., Quincy, Ill.

KLENK'S Double Action Aviation Snips

Illustration is a Left Hand Snip



1. Detachable rubber grips over handle of chrome molybdenum steel
2. Adjustable lock
3. Special hardened alloy steel. Tensile strength 8500 lb.
4. A. & H. Standard bolts
5. Curved jaws for cutting ends of tubing to .065 in. wall

BIG VALUE—LOW COST—A trial will convince you. Made for both right and left hand—straight or curves—Easy to work—Order today.

KARL KLENK'S AVIATION SNIPS
107 E. FIFTH ST. WILMINGTON, DELAWARE

Bookkeeping— A Chart of Accounts

(*Continued from page 69*)

what allowances are being made in the billed prices of goods. If the customer is overcharged, the management should find out how it happened, and take steps to correct the fault. Nothing so offends a customer as to find that he has been overcharged. Of course, if there are overcharges, it would naturally follow that there may also be undercharges, but the customer will rarely call attention to an undercharge. By watching the entries which fall into these "Returns and Allowances" accounts, the management may uncover errors of pricing which will save him a great deal of money.

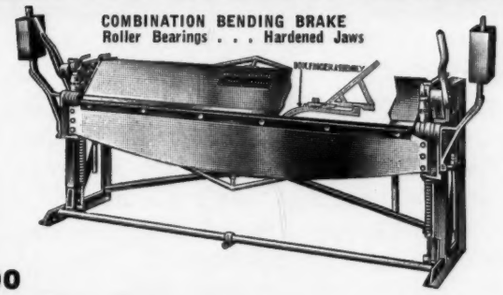
121—COST OF SALES—MATERIAL.
122—COST OF SALES—LABOR.
123—COST OF SALES—APPLIANCES.

124—COST OF SALES—APPLIANCES, WHOLESALE—We shall discuss these "Cost of Sales" accounts as a whole, the principle underlying them being the same—the only difference is in the nature of the sales here costed. In our discussion of the asset account "Work in Process" we showed the flow of material and labor into work, through this work in process account, which, in turn, is represented by the job cost records. Upon completion of a job and its being billed to the customer, it is essential that the cost of the job, in its several parts, be taken, by journal entry, out of this work in process account and charged to the proper cost of sales account. Ordinary sales of material, appliances or labor, would, of course, be taken into consideration on the same basis as the larger jobs, and the cost of the material, appliance or labor sold would be properly recorded in the closing entries at the end of each month. In other words, every sale during a given month would have its cost computed and recorded in the proper cost of sales account. If material was taken from the store room and sold, as is, the sales ticket would show the kind and quantity of material thus sold and it would require a journal entry to take that material out of material inventory and put it in the Cost of Sales—Material. The sale would automatically fall into the Sales of Material account, and thus would show the sale and the cost of that sale.

131—DISCOUNT TAKEN—This is provided to contain the discounts taken on purchases. By the careful watching of discount dates, the management may realize a tidy sum from this source. The discount allowed for the prompt payment of an invoice is not a reduction in the cost of that material, but a fee allowed for prompt remittance.

BENDING BRAKES **WHITNEY-JENSEN** METAL TOOLS

COMBINATION BENDING BRAKE
Roller Bearings . . . Hardened Jaws



DO

BETTER SHEET METAL WORK

WITH THESE TOOLS...

The two machines shown here are specially designed to meet modern standards of accuracy and production. The Brakes have roller bearings that permit 40% faster work and are 20% easier on the operator. Also, hardened jaws —a new feature—permit proper fabrication of stainless steels. The Foot Presses, available in four sizes, are ideal for jobbing and light production work. Capacity is 2" hole in 16 ga., 100 holes per minute or better. Special forming and bending dies may also be used.

No. 58 Foot Press

Write for new Catalog No. 14, giving latest data on over 80 useful items.

WHITNEY METAL TOOL CO. • 91 Forbes Street, Rockford, Illinois

"I wouldn't change my Williamson Line"

"The Williamson Heater Company:

I wouldn't change my Williamson Agency for any other line. I have been in the heating business for the past 30 years. I have sold several makes of furnaces but Williamson surpasses them all. It is nationally advertised, but the best advertising I have is a long list of satisfied users.

It's easy to sell a Williamson because it takes less fuel to operate and every room is the same temperature with the automatic controls; then too, it's guaranteed for 20 years.

Comfort, convenience, and economy; that's why last year was the biggest year I have ever had."

Signed— X Y Z, ... Kentucky.

Complete information; name, address of writer of above letter furnished on request. Phone, wire or write The Williamson Heater Company.

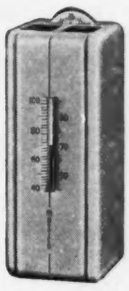
FREE: Complete, easily understood short method for figuring air conditioning job. You can complete your figures, price job in one hour flat. Write Dept. No. 2. The Williamson Heater Company, Cincinnati, Ohio.

Complete Line . . . Quick Service

WILLIAMSON
WARM AIR FURNACES
1890 — Golden Anniversary — 1940

RUGGED CONSTRUCTION SIMPLE OPERATION

Those are the features that assure the trouble-free operation and long life of this regulator. For you, this means freedom from service calls and a friendly feeling on the part of your customers . . . when you install the



MASTER

HEAT REGULATOR TYPE A-23

This positive, snap action regulator operates on a differential of only ½ degree. Accurate, dependable, low cost, it will outlast the heating plant itself. Operates quietly, surely, and safely—to the complete satisfaction of the most exacting user. Write us today for bulletin giving complete information on the Master line.

Makers of Dependable Regulators for 25 Years

WHITE MFG. CO.
2368 University Ave. ST. PAUL, MINN.

YOUR BLOWER REQUIREMENTS

available at

Schwitzer-Cummins Company

• BLOWERS FOR EVERY PURPOSE
HY-DUTY Blowers, 9¾" to 25".
Top and Bottom Horizontal, and Top and Bottom Vertical Discharge.
Top and Bottom Motor Mounting.
Dual Units also available.

• CENTER DISC WHEEL
Double Inlet, Double Width.
Reinforced Center Disc.
Designed for Modern Air Conditioning and Heating Applications.
Sizes, 4½" to 50".

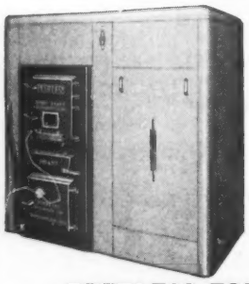
• SINGLE INLET WHEELS
For Oil Burner, Stoker, and Air Conditioning Applications.
Sizes, 4½" to 50".
Variety of Blade Lengths for each diameter.

• ENGINEERING DATA
Write for Catalogues showing complete Performance Data.
Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
125 FAN STREET INDIANAPOLIS, U. S. A.

PARKER-KALON
Jiffy
REGULATOR SET
SIMPLE . . . LOW COST
SAVES TIME
AND LABOR
For controlling dampers in heating, ventilating, air conditioning systems.
PARKER-KALON CORP., 200 VARICK ST. NEW YORK, N. Y.
INSTALLED IN A JIFFY!
Slip on FRAME and LEVER
Turn WING NUT
SOLD ONLY THROUGH RECOGNIZED DISTRIBUTORS

PEERLESS HAS FURNACES
FOR ALL TYPES OF BUYERS



No class of buyer is overlooked in the complete Peerless line of round furnaces and automatic air conditioners. Built in our own foundry and metal working plants, these units are handsome in appearance, efficient in operation and low in price. Units for completely automatic operation in small homes are especially popular. Get literature, discounts and full information by return mail.

PEERLESS FOUNDRY COMPANY
1853 LUDLOW AVENUE INDIANAPOLIS, IND.

THE THIN MAN
TRADE MARK

will be "The New Little Arrival" in the Register and Grille field next month. Watch for it.

REGISTER & GRILLE MFG. CO., INC.
70 Berry Street Brooklyn, N. Y.

REPAIR PARTS?

. . . to fit every make and description of heating or cooking unit may be secured immediately upon order . . . and you can bet that if it's the finest quality at a low price you are seeking . . .

CAPITOL HAS IT!
CAPITOL FURNACE AND STOVE REPAIR CO.

443 E. Washington St., Indianapolis, Ind.

It is, therefore, shown in this separate account, which will appear in the operating statement as "other income" indicating that it is not from operation of the business, but an earning from other sources.

132—INTEREST EARNED—This account is to contain any interest earned on notes receivable, or from investments, and is to appear in the operating statement as "other income" indicating that it is not from operation of the business, but an earning from other sources.

133—COMMISSIONS EARNED—In the average shop there are times when a product is handled on a commission basis—not bought and sold, as in the ordinary operation of the business. This account will contain any such earnings from Commissions.

◆

Handcrafted Specialties By Zansler Bros., New Orleans

(*Continued from page 62*)

ment and sale. Bottoms and tops were stamped, sides were cut and formed and the parts hand seamed and soldered. Slip tops and sealed tops were made as ordered. This business continued to about 1931, when changes in methods of packing, shipping and mass production destroyed many markets. The brothers, about this time, branched out for themselves and, after following sheet metal work of all kinds, began to specialize. Today, Zansler Brothers carries on the tradition of fine sheet metal handcraft, and makes the specialization pay.

◆

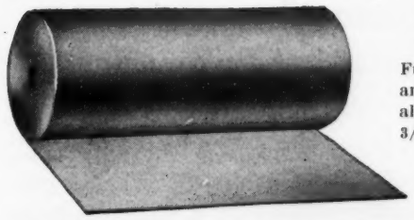
Copper Resists 50 Years Exposure

(*Continued from page 53*)

pan sheet and batten cover. This is shown in a closeup photograph. The dormer ornamentation and the dormer faces and cheeks were found to be in excellent condition, so no material was removed and no repair was required. Where our new roof meets round-topped dormers the dormer roof was carried up the tower roof approximately 12 inches and double locked to the pan sheets.

"The large 'H' insignia shown on the tower closeup is one of four Neon signs which will occupy the four sides. We worked with the manager of the sign company to detail the framing which we insisted should be bronze for all exposed angle framing, struts, and connections to the roof. We insisted on this to prevent any staining of the copper roof which would follow the use of any ferrous material.

"Practically the only place where solder was used is on the round dormer roofs and connecting gutter. We are proud of the fact that less than five pounds of solder were used on the entire roof installation."



Asbestos Paper and Rollboard

Furnished in 8, 10, 12, 14 and 16 lbs. per 100 sq. ft., also in thicknesses of 1/16, 3/32 and ⅛". Rolls 18, 24 and 36" wide containing approximately 50 or 100 lbs. each.

SAL-MO ASBESTOS PAPERS

Your jobber *knows* the quality of all SAL-MO Asbestos Products and can quickly furnish you with the proper materials for insulation of all Warm Air Heating and Air Conditioning installations.

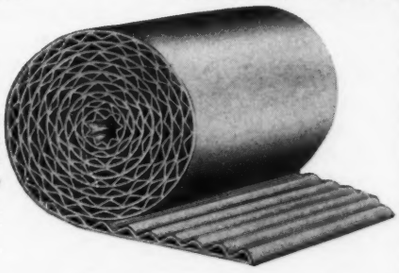
See Your Nearest Jobber and Ask For SAL-MO ASBESTOS MATERIALS.

SALL MOUNTAIN COMPANY

176 West Adams Street **CHICAGO, ILLINOIS**

Asbestos Corrugated Aircell Paper

Aircell, ¼" corrugations; Sixcell, 1/6" corrugations; Multicell ⅛" corrugations; Rolls contain 250 square feet, 36½" wide.



THE PROFITABLE LINE FOR '41

JANITROL

GAS FIRED

- CONDITIONERS
- GRAVITY FURNACES
- UNIT HEATERS
- CONVERSION BURNERS

SURFACE COMBUSTION CORPORATION
TOLEDO, OHIO

MEMO

FROM: Sales Manager

TO: Adv. Manager

Please make a note of the important message about January 1941 in the December issue of AMERICAN ARTISAN.

P. S. You'll find it on page 10.

NEW AIR CONDITIONING REGISTERS

The New Rock Island line of Air Conditioning Registers now shown in complete new catalogue just off the press.

No. 822 Wall Register---Horizontal Vanes

The New Rock Island Air-Vane Registers are of bar type fabricated construction—Attractive Appearance—Rigid Construction—Vertical or Horizontal Vanes—Simple, secure adjustment.

New Catalogue and Dealers Net Estimating Book, a time and money saver, gives full particulars, prices, etc.

Mail Coupon Today

ROCK ISLAND REGISTER CO.
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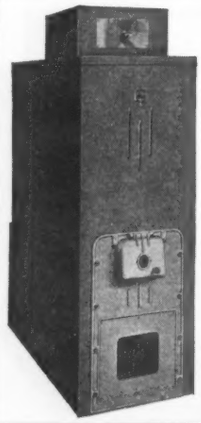
Mail me a copy of your new catalogue and dealer's net estimating book.

Name .....

Street Address .....

City & State .....



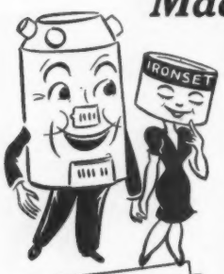
You Can Stand Behind
TORIDHEET
and be Mighty Proud You're Selling It

The Toridheet franchise includes: (1) a *complete* line of heating equipment . . . furnaces for all three fuels . . . air conditioning units . . . wall-flame and pressure atomizing oil burners . . . water heaters and oil-burner boilers. (2) close factory co-operation (3) hard-hitting sales promotional material (4) a greater net profit.

Write today for details on the Toridheet line.

CLEVELAND STEEL PRODUCTS CORPORATION
TORIDHEET DIVISION
Madison at W. 74th Cleveland, Ohio

Made for each other...



FOR TIGHTER JOINTS... MORE PERMANENT SEALS!

Make new friends and keep them with Ironset Furnace Cement.

Don't risk your customers' good will with haphazard cement work—when Ironset is so easily available and guarantees a gas-tight seal in setting up new furnaces or resetting old units.

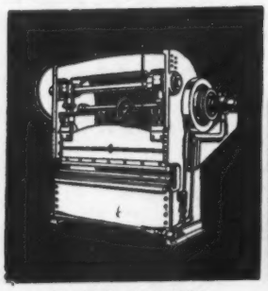
Ironset Asbestos Cement is made especially for furnace work. It withstands higher temperatures than ordinary cements, does not shrink, crack, bloat, or blister. Can be fired immediately. Can even be applied to hot metal. Don't delay—try Ironset on your next furnace job.

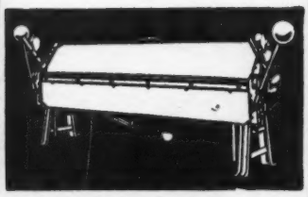
Stocked by leading jobbers in 1, 5, and 10-lb. cans, and 50 and 100-lb. drums. Order from him or write direct for prices and free bulletin.

Fireline Stove & Furnace Lining Co.
1816 Kingsbury St., Chicago, Ill.

IRONSET
FURNACE CEMENT

CHICAGO



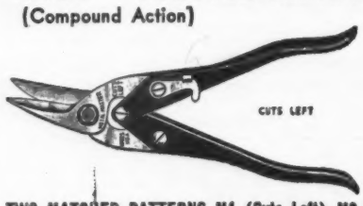


PRESS BRAKE HAND BENDING BRAKE

Steel Brakes—Presses—Shears

DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. CHICAGO

WISS "METAL-MASTER" SNIPS
(Compound Action)



"TWICE THE WORK WITH HALF THE EFFORT"

TWO MATCHED PATTERNS M1 (Cuts Left) M2 (Cuts Right) Cut circles, squares and any irregular patterns on Stainless, Dural and Monel Metals with the greatest of ease. Jaws of wear-resisting Manganese Molybdenum Steel. Handles hot-pressed from tough Chrome Vanadium Steel. Nickel steel bolts and nuts to Government specifications. All parts interchangeable. Detachable rubber handle grips at slight extra cost.

J. WISS & SONS CO.
ESTABLISHED 1848 NEWARK, N. J.

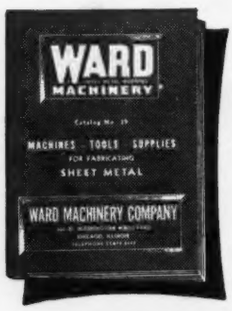
Air Conditioning An Airport Administration Building

(*Continued from page 37*)

delivering 2400 cfm against 7½ inches of water resistance pressure, and runs only when conditioned air is actually desired for a plane or planes. In operation the plane comes to rest near a service box. An attendant carries a 5-inch flexible hose to the box, and connects the air supply from the service nozzle to a receptacle on the plane. He then starts the fan by pushing a starting button in the service box and with the damper regulates the air-flow to maintain comfortable conditions aboard the plane while it is at rest. No thermostatic temperature control is available, but the fan intake is connected through a heating coil which will permit of the use of the conditioning system both summer and winter.

Plumbing, heating and ventilating, air conditioning, roofing and exterior sheet metal work for this project were furnished by AAA Sheet Metal Works of Dallas, with Wm. F. Kaun & Son.

Edward M. Rice, 53, proprietor of the Rice Sheet Metal & Roofing Co., Superior, Wisconsin, died September 11 of a heart attack. A native of Norway, Mr. Rice had been a resident of Superior for 31 years. He is survived by his wife, three sons and a daughter, his parents, six sisters and a brother.



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Devoted entirely to machines, tools and supplies for fabricating sheet metals exclusively. If not write us today.

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564 W. Washington Blvd., Chicago, Illinois

Improve Your Winter Business with the
GRAND RAPIDS FURNACE CLEANER

Free Trial
Convenient Terms

Write for Details

DOYLE VACUUM CLEANER CO.
227 STEVENS ST., S. W. GRAND RAPIDS, MICH.

Technical Code— Precalculated

(*Continued from page* 43)

Having two exposures in some of the second floor rooms, it is necessary to make two deductions. As an example, bedroom No. 1 has 168 square feet of outside wall and 184 square feet of attic wall. Incidentally, the closet wall was figured as attic wall. There are three windows in this room, each having 9 square feet of area. Two windows are in the outside wall and one of them—the dormer window—is in the attic wall, so the net for outside wall is 168 square feet less 18 square feet, making 150 square feet. For the attic wall, the net will be 184 square feet, less 9 square feet, making a net of 175 square feet. This net, for the attic wall, is placed in the extra column, which was included on the data sheet for such additional exposures, and the head written in.

The ceiling and floor are self-explanatory, being the product of length and the width. The ceiling areas on the first floor are those parts under the attic space only. The areas are found in the same tables (Fig. 6 and Fig. 7) and in the same way, that the wall areas were found.

With the physical data properly noted on the data sheet, it is possible to proceed with the heat loss calculations. The charts and explanations for that will appear in the next issue.

SELL SANIDAIRE

The Complete Portable Humidifier

A WINTER PROFIT MAKER

Burning noses, flaming throats, need the relief of humidified air. Sanidaire evaporates 4 to 8 gallons in 24 hours. Healthful, pleasant, humidified air, filtered free of dust and dirt, is gently circulated without draft. Plugs into electrical outlet. 17 years of fine engineering developed this superior humidifier with many exclusive features. Sanidaire is the biggest value on the market.

UNITED STATES AIR CONDITIONING CORP.

NORTHWESTERN TERMINAL • MINNEAPOLIS, MINN.

IN EMERGENCIES...
Repair cracked firepots and give heat the same day!

With Fireline you can give real emergency service on furnaces . . . can repair cracked, broken, or burned-out firepots in a few hours without new castings—can give heat the same day. This plastic fire brick material is molded one to 1½ in. thick to cover inside firepot wall. It sets with an ordinary fire into a gas-tight, one-piece fire brick lining that burns fuel more completely, eliminates odors, soot, and reduces ash.

Fireline is stocked by leading jobbers in 50 and 100-lb. drums. Order from your jobber or write us for bulletin, prices, and sales helps.

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury St.
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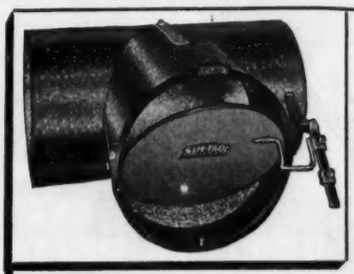
FIRELINE



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SIMPLEX AUTOMATIC DRAFT CONTROL

FUEL SAVINGS
FOR YOUR CUSTOMER..

EXTRA MONEY
FOR YOU!

Fuel savings for the customer are possible through installation of the Sim-Trol Automatic Damper. Draft is held constant to 1/100 of an inch of the desired point under all atmospheric conditions. By maintaining a balanced draft this superior automatic damper assures greater fuel savings, reduced stack losses and greater customer satisfaction on all your heating jobs.

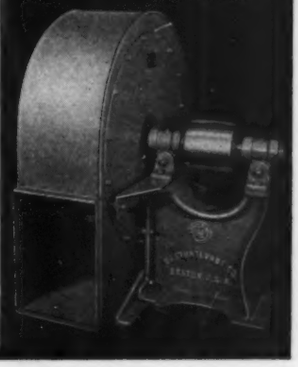
You'll stand to make some "real money" by specifying and installing the Sim-Trol Automatic Damper. Write for details.

SIMPLEX MANUFACTURING COMPANY
196-206 NORTH MAIN STREET, FOND DU LAC, WISCONSIN

MILL EXHAUSTERS

1. Designed and built by the **Pioneer** exhauster manufacturer.
2. Result of over 75 years of air engineering experience.
3. High efficiency assures low power consumption.
4. Sturdy construction assures dependable service.

Write for Catalog No. 430



B. F. STURTEVANT CO.
Hyde Park, Boston, Mass.
Branches in Principal Cities

Air Conditioning

—What happens between two rooms, one having a six minute air change, and the adjoining room a twelve minute air change?

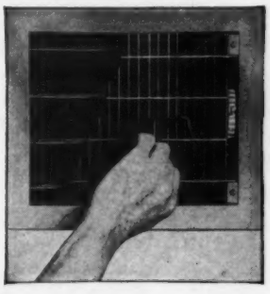
—Can you install a thermostat control system properly?

The answers to these and hundreds of other mechanical questions about air conditioning are appearing in the monthly *Air Conditioning Section* of AMERICAN ARTISAN.

If you do not now get the ARTISAN, send us $2 and we will enter your subscription for a full year—12 consecutive issues. Your subscription will yield a rich harvest of money making ideas and solutions to many mechanical problems connected with warm air heating and sheet metal contracting.

AMERICAN ARTISAN
6 North Michigan Ave. Chicago, Ill.

REGISTERS & GRILLES



The "Air-Con" Finger Tip Air Control Double Diffusing Registers

Can direct the air flow up or down and to the right or left. This is in addition to our extensive line of registers, perforated sheets, and ornamental grilles.

Write for our catalog.

STANDARD STAMPING & PERFORATING CO.
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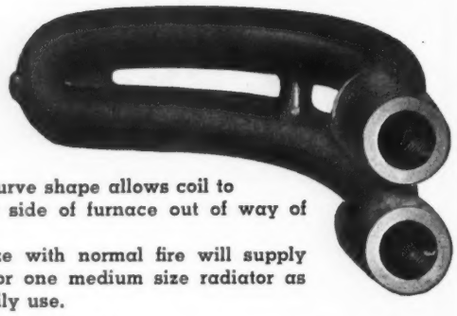
ADAMS CAST IRON WATER COIL



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Larger size with normal fire will supply hot water for one medium size radiator as well as family use.

Holes center to center 2½"
Tapped for 1" pipe. May be tapped for ¾" pipe on request.
No. 1450 Wt. 10 lbs. Length 13½"
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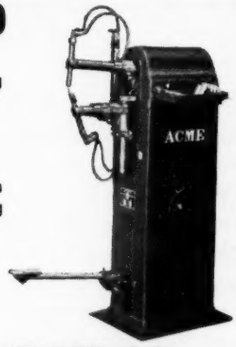

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Lifetime Guarantee!

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Gas Pressure REGULATORS for Reliability!

Certified by A. G. A. Testing Laboratory. Write for Catalog and Prices on Barber Conversion Burners, Appliance Burners and Regulators.

Sizes ¼" up.

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SELL MORE FURNACES with this NEW LOW PRICE

Breuer's Ball Bearing TORNADO
Furnace and Boiler Vacuum Cleaner

Ask for FREE SALES PLAN and Demonstration

Not only does it excel in furnace and boiler cleaning, but it puts you directly in touch with the furnace and repair needs of your customer. Not a converted household cleaner, but DESIGNED FOR THE JOB. Complete set of necessary attachments.

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PORTABLE SHEARS
ALL-ALLOY

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be had for shearing stainless steel.

FULLY GUARANTEED

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Distributors of All Heating and Air Conditioning Equipment
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GREAT NATIONAL AIR CONDITIONING CORP.

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Manufacturers of

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Blowers
Fans

Any range 15 F.P.M. to 24,000 F.P.M.

TAKES JUST A MOMENT TO CHECK AIR VELOCITIES WITH THE

Alnor ALL PURPOSE VELOMETER

You can save time and know whether your heating and air conditioning jobs are right when you use the "ALNOR" Velometer. Without timing or complicated mathematical calculations the Velometer gives direct, accurate, instantaneous air velocity readings. Many users report that with the Velometer they can check and balance a system in one tenth the time formerly required, and the Velometer gives them a picture of air distribution that no other instrument can. Write for details.

ILLINOIS TESTING LABORATORIES, INC.
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Drill Concrete with the "Do-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. 2 tools in 1. Easy to maintain—Pays for itself. Bulletin No. 381.

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MAKE YOUR OWN GUTTER AS YOU WANT IT

Easily and quickly operated. Soon pays for itself.

REPLACEMENTS

Beading Rods, Handles, Rolls, etc., quickly furnished.

STERLING BEADER

A simple and inexpensive machine for forming round bead.

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SITUATIONS OPEN

WANT sales engineer, willing to travel. Prefer some experience air conditioning field or evaporative cooling sales. CENTRAL or EASTERN STATES. State salary. Address Key No. 516, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

SALESMEN WANTED—The Lennox Furnace Company is building a new factory at Columbus, Ohio, to service Central and Southern States. Will have openings for several experienced, aggressive, hard hitting salesmen. Write stating experience and qualifications to W. B. Shirley, Sales Manager, The Lennox Furnace Co., Columbus, Ohio.

Salesman Wanted: Manufacturer of warm air furnaces, winter air conditioning units, boilers and radiation wants well qualified salesman to cover the States of North Carolina and Virginia. Address Key No. 520, American Artisan, 6 N. Michigan Ave., Chicago.

Salesman Wanted: Manufacturer of warm air furnaces, winter air conditioning units, boilers and radiation wants well qualified salesman to cover the State of Connecticut and a part of Massachusetts. Address Key No. 521, American Artisan, 6 N. Michigan Ave., Chicago.

SITUATIONS WANTED

Sales Engineer—Interested in organization and promotional work in warm air heating field. Fifteen years experience in all branches of heating, ventilating and air conditioning with thorough knowledge of furnaces, stokers, oil burners, temperature control, boilers and unit heaters. Address Key No. 523, American Artisan, 6 N. Michigan Ave., Chicago.

Prefer Detroit, have covered middle-western states. Experienced in wholesale, retail and branch operations. Address Key No. 518, American Artisan, 6 N. Michigan Ave., Chicago.

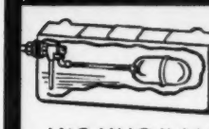
AGENTS WANTED

Nationally advertised line of air filters now used as standard equipment by many of the country's largest and best known manufacturers of heating and air conditioning equipment want Manufacturers Agents to sell to manufacturers and wholesalers. Only agents with experience and who are established in territory will be considered. Several territories open in Texas, New Mexico, Nevada, Utah, Nebraska, North Dakota, South Dakota, Alabama, West Virginia, Eastern Pennsylvania, Upper New York and New England. Address Key No. 519, American Artisan, 6 N. Michigan Ave., Chicago.

FOR SALE

On account of necessary expansion in other lines, we are offering for sale dies, equipment, and good will for the manufacture of metal ceiling of a special construction. Reasonable in price. A good opportunity to enter this field or to expand your present business. Address Key No. 522, American Artisan, 6 N. Michigan Ave., Chicago.

HUMIDIFIER ASSEMBLY
For Warm Air Furnaces



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INDIVIDUALLY BOXED FOR COUNTER DISPLAY

LIST PRICE **$2.22**

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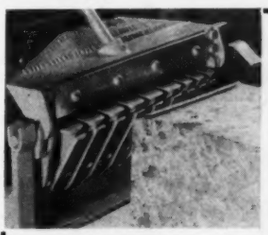
ROCKFORD, ILLINOIS



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Be PROUD of your WORKMANSHIP, and make MONEY too. CARELESS Drive Cleating can spoil the APPEARANCE of the entire Job.

SMITH'S CLEAT BENDER

Will make PERFECT Drive Edges on the ends of square pipe, and make PERFECT Drive Cleats to join them together.

See your dealer, or write.

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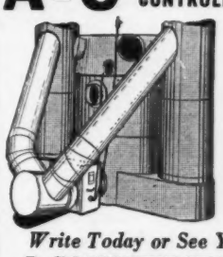

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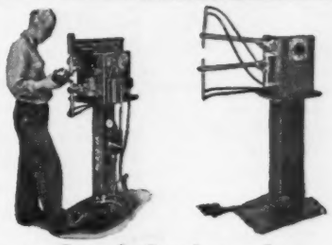

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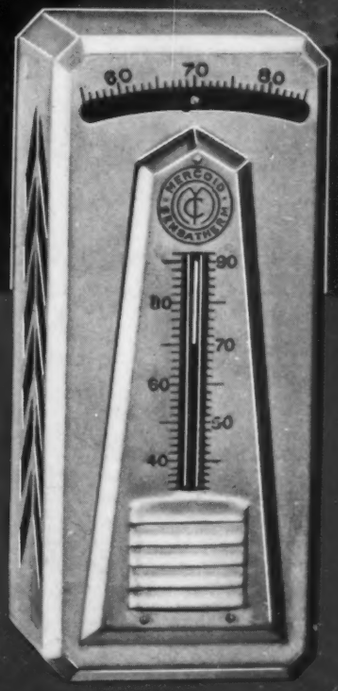
Our experience on installations with Mercoid Controls has been most satisfactory. Our customers are pleased, and what's more, our profits are protected.

We know of no thermostat which has so many points in its favor as the Mercoid Sensatherm. It is the most dependable instrument of its kind and does not have to be adjusted every year. It maintains an even room temperature at all times.



The mercury switches used in all Mercoid Controls are a very desirable feature, because no dust or other interferences can get at the contacting surfaces. This eliminates the source of contact trouble

We like Mercoid Limit Controls for their dependable service, long life and the ease with which they are installed and adjusted. The two-wire system and plainly marked terminals save time and eliminate confusion.

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We have found out by experience, the way to minimize trouble is to specify Mercoid Controls -- that holds good for the entire line. They have saved us many a dollar on unnecessary service calls.

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Hydraulic Action

DOES provide the answer to your control problems

Mr. Blank ★

Yes...

the line carrying the liquid charge is flexible and can be bent into any position.

Yes...

the Hydraulic-Action element can be furnished in lengths to fit particular applications when ordered in quantities to justify special production.

October 17, 1940

Chief Engineer
White-Rodgers Electric Company
1215 Cass Avenue
St. Louis, Missouri

Dear Sir:

Reference is to your back page ad, American Artisan of October, with attention to Type 513 Single Speed Fan Control.

Information in this ad convinces me that you have the answer to our Control Problem, as other stock controls do not permit satisfactory installation with our equipment.

There are several questions that I would like to have you answer.

First, is the line carrying the liquid flexible?

Second, can it be furnished in varying lengths?

Third, is it ever necessary to have access to the sensitive element?

Fourth, what is the life span of the control under the average working conditions?

Please send copy of your Condensed Catalog and quote prices in quantity lots to manufacturer.

Yours very truly,

R J Blank

No...

it is not necessary to have access to the sensitive element once it is installed.

The Life Span of the Control...

will normally greatly exceed the life of the equipment with which it is used.

★

The name of the author of this unsolicited letter will be furnished upon request.

Hydraulic Action Controls have dials accurately calibrated in degrees Fahrenheit with cut-in and cut-out indicators for quickly and accurately setting exact temperatures for each application. This simplicity of adjustment, plus higher current ratings, ease of installation and many other outstanding features is saving installation time and eliminating service worries for heating men throughout the country.

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